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IDENTIFIERS	*Illinois (Chicago); *Tech Prep

ABSTRACT

During its first year of development in 1991, the Chicago Manufacturing Technical Preparation (Tech Prep) Program established a plan for implementing an industry-driven, articulated 4-year manufacturing technology course of study that integrates applied academic courses with technical courses and meets industry hiring standards. The project secondarily intended to help metalworking companies to become more competitive through development of human resources. The program provides a structured career path for students to go to higher education or to employment. The program model was developed by a planning team of business, industry, government, labor, civic, and education representatives. An articulation agreement was negotiated between the City Colleges of Chicago and the Chicago Public Schools. Core industry standards being developed by Northern Illinois University are to be used to develop and refine the curriculum for the program, and the program is to be implemented during 1992. (Nine appendixes, which make up most of the report, include a list of advisory council members, the career preparation initiative model developed, building renovation plans, a draft of the multiple spindle screw machine curriculum, resumes for the final candidates for director of the project, a marketing plan, a draft plan for work-based learning, a curriculum articulation agreement, and a sample contract for paid participants.) (KC)

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ILLINOIS STATE BOARD OF EDUCATION
100 North First Street, Springfield, Illinois 62777-0001

Thomas Lay Burroughs, *Chairman*
Robert Leininger, *State Superintendent*

ED347351

CHICAGO MANUFACTURING TECH PREP

FISCAL YEAR 1991 FINAL REPORT

Funding Agreement Number 1-0907-503

JTPA $35,000

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Office of Educational Research and Improvement
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Tech-Prep

ILLINOIS STATE BOARD OF EDUCATION
Department of Adult, Vocational and Technical Education
100 North First Street
Springfield, Illinois 62777

FUNDING AGREEMENT
For Vocational and Technical Education

FY 91

CHECK APPROPRIATE SECTION:

- ☐ Planning and Reporting
- ☐ Adult and Continuing Education
- ☐ Job Training
- ☐ Other (specify) _____
- ☐ Vocational Ed. Program Approval and Evaluation
- ☒ Vocational Ed. Program Improvement
- ☐ Vocational Ed. Program Services

This funding agreement is between the Department of Adult, Vocational and Technical Education, Illinois State Board of Education and the following institution or agency.

INSTITUTION OR AGENCY	BOARD OF CONTROL CHAIR, PRESIDENT OR RESPONSIBLE OFFICIAL
City Colleges of Chicago	Josue M. Gonzalez
ADDRESS OF INSTITUTION OR AGENCY: 226 West Jackson Blvd. Chicago IL 60606-6998	PHONE: 312-855-3093
PROGRAM OR PROJECT TITLE: Manufacturing Technical Preparation Development	
NAME OF PROJECT DIRECTOR: Sandra Filion Foster	DATES: Starting Date 7/1/90 Ending Date 6/30/91
ADDRESS	PHONE: 312-855-8082

REQUEST

	LOCAL	AVTE	TOTAL
REQUESTED ANNUAL BUDGET	$ 35,000	$ 35,000	$ 70,000

Vocational education funds are requested to provide financial support for the vocational/technical education activities as described in this agreement. This project shall meet State of Illinois and Federal legal requirements, where applicable.

Patricia A Burk — Assistant Secretary
Date — Signature of Board Officer (Public Schools and Post-Secondary Only) — Title

8/30/90 — Josue M. Gonzalez (sig) — Vice Chancellor
Date — Signature of Board of Control Chair, President or Responsible Official — Title

TRANSMITTAL

This is to acknowledge the receipt of the proposed funding agreement for vocational and technical education activities, services and programs, and transmittal of same to the Department of Adult, Vocational and Technical Education.

— For University Use Only —

Date — Signature of Liaison Officer (Occupational Educator Coordinator) — ILLINOIS STATE BOARD OF EDUCATION Department of Adult, Vocational and Technical Education

— For Community College Use Only —

SEX EQUITY ADMINISTRATION

Date — Signature of Illinois Community College Board Representative — Position

— For Public School Use Only —

Date — Signature of Regional Superintendent — County

– APPROVAL –

State and/or Federal vocational education funds are obligated in the amount of $ 35,000 for items approved in the estimated budget. Adjustments and/or modifications are subject to written approval by both parties of this funding agreement.

1-0907-053
Agreement Number

OCT 2 2 1990
Date

Richard J Miguel
Signature of Assistant Superintendent

ABSTRACT

The goal of the Chicago Manufacturing Tech Prep Program during Fiscal Year 1991 was to establish a plan for implementing an industry-driven articulated four year manufacturing technology course of study that integrates applied academic courses with technical courses and meets industry hiring standards enabling students to obtain transferrable competencies. Second, to assist metalworking companies to become more competitive, particularly through development of human resources.

Because the Illinois State Board of Education awarded the City Colleges of Chicago (CCC) a grant for $35,000 a plan has been initiated for developing a Manufacturing Technology Preparation Program in cooperation with the Chicago Public Schools (CPS). The program design provides a structured career path for students to make a smooth transition from high-school to higher education and/or the workplace with career potential and mobility.

A planning team comprised of business, industry, government, labor, civic and education representatives has developed the Career Preparation Initiative (CPI) model for the school-to-work transition as a means of meeting the current and near future labor demands for the city of Chicago.

The articulation agreement between the City Colleges of Chicago and the Chicago Public Schools is firm.

The Tech Prep and CPI are the framework in which the Metalworking I-Team has been working collaboratively to build on the core industry standards being developed by Northern Illinois University. The industry standards will be used to develop, and adjust curriculum for the Chicago Public Schools, and the City Colleges of Chicago. The Tech Prep and CPI are the framework in which the Metalworking I-Team has been working collaboratively to build on the core industry standards being developed by Northern Illinois University. The industry standards will be used to develop, and adjust curriculum for the Chicago Public Schools, and the City Colleges of Chicago. The continuation and implementation plans for the Manufacturing Tech Program is outlined in the FY'92 Tech Prep Proposal.

MANUFACTURING TECHNICAL PREPARATION DEVELOPMENT
YEAR-TO-DATE EXPENSE ANALYSIS
as of *April 08, 1991

OTHER	BUDGET	EXPENSES	BALANCE
Supplies	1,500	---	1,500
Ed. Materials	1,000	---	1,000
Professional/ Technical Services	30,000	20,000	10,000
Out-of-town-Travel	1,500	60	1,440
Local Travel	1,000	---	1,000
TOTAL	$35,000	$20,060	$14,940

* per CCC official records
April 16, 1991

REVISED
GRANT BUDGET
CENTRAL OFFICE
MANUFACTURING TECHNICAL PREPARATION DEVELOPMENT
07/01/90 TO 06/30/91

FUND: 5
GRANT NUMBER: 15158
PCS/CIPS CODE: 12/000000
GRANTOR: ISBE/DAVTE

PERSONNEL COSTS

BOARD TITLE	NAME	CAT.	BOARD SALARY	CONTRACT SALARY	SD %	OBJECT/ FUNCTION	LINE ITEM SUB-TOTAL	LINE ITEM TOTAL

OTHER COSTS

		OBJECT/ FUNCTION	LINE ITEM SUB-TOTAL	LINE ITEM TOTAL
OFFICE SUPPLIES	N/A	4231	-	1,500
EDUCATIONAL MATERIALS	N/A	4843	-	1,000
PROFESSIONAL/TECHNICAL SERVICES	N/A	5135	-	30,000
OUT-OF-TOWN TRAVEL	N/A	6071	-	1,500
LOCAL TRAVEL	N/A	6133	-	1,000
TOTAL, OTHER COSTS				35,000
GRAND TOTAL				35,000

AUTHORIZED:

****THIS GRANT SUPERCEDES 5-60120****

ASSOCIATE CONTROLLER
DIR., FISCAL AFFAIRS

2/15/91
2/15/91

DATE: FEBRUARY 15, 1991

Official Project Title: CHICAGO MANUFACTURING TECHNICAL PREPARATION PROGRAM

Department of Adult, Vocational and Technical Education Funding

Agreement Number: 0-9070053, SDA #9

Project Director: Sharon J. Wheeler, Executive Director Partnership Programs

Funded Agency: City Colleges of Chicago

Location of Funded Agency: 226 West Jackson Boulevard, Chicago, IL 60606

Time Period Covered: July 1, 1990 - June 30, 1991

Funding Source: JTPA, $35,000

Goal(s) of the Project and its Relevancy to Vocational Education:

The goal of the Chicago Manufacturing Tech Prep Program during fiscal Year 1992 was to establish a plan for implementing an industry-driven articulated four year manufacturing technology course of study that integrates applied academic courses with technical courses. The project's intent is to move rapidly toward diffusing secondary-postsecondary manufacturing technology programs throughout the City Colleges and Chicago Public Schools in occupational training programs that blend technical and academic study and lead to jobs upon completion of studies. Achievement of this goal will mark a major contribution to improving the access of Chicago's large population of underserved, minority students to the highest quality in higher education.

For decades technical education has been relegated to the educational back burner: last in line for funding, often regarded as a haven for low-achieving students and their teachers, the main--but dead-end--track for minority students, and for employers a second choice recruitment source. But, today's realities demand a speedy turnabout in the image and status of technical education, reform of its planning processes and delivery systems, and dramatic upgrading of its effectiveness and value for all students, especially minority students, and employers. The business community has joined with the City Colleges of

Chicago in a collaborative venture for workforce development, Productive Chicago. The Chicago Public Schools, the Chicago Federation of Labor, community and civic organizations are working together under the leadership of the City Colleges of Chicago and the Economic Development Commission of the City of Chicago.

One of the top priorities emerging through this collaboration is manufacturing technology, specifically metalworking. Chicago, because of its central location and interdependent network of suppliers, services and markets, is the national center of the metalworking industry. Metalworking is the city's third largest manufacturing employer, representing 28,000 existing and potential jobs. However, Chicago's Metalworking Industry is losing its competitive edge. In order to remain a national leader in this industry, Illinois' metalworking firms must be able to rapidly adapt to shifting market trends. While a number of companies have left this area, large Illinois corporations such as Caterpillar, John Deere, Diamond Star, Motorola, AM International, Navistar International and Illinois Tool Works, depend on the product quality of local, small and medium size supplier firms.

While the location criteria of the firms that are left cannot be reduced to any one business climate factor in Illinois, the competition for remaining Illinois metalworking suppliers will predictably intensify as they vie with supplier firms closer to relocated customers.

Productive Chicago established two major goals for the metalworking industry. First, to develop a manufacturing technology Tech Prep program designed to meet industry hiring standards and enabling students to obtain transferrable competencies. Second, to assist

metalworking companies to become more competitive, particularly through development of human resources.

Because the Illinois State Board of Education awarded the City Colleges of Chicago (CCC) a grant for $35,000 a plan has been initiated for developing a Manufacturing Technology Preparation Program in cooperation with the Chicago Public Schools (CPS). The program design provides a structured career path for students to make a smooth transition from high-school to higher education and/or the workplace with career potential and mobility. This model is replicable for developing any industry related articulation program. For Manufacturing Technology, it provides the latitude and model for expansion to other sub-sectors of this industry. For example, Gear Manufacturing .

The objectives of the FY'91 Manufacturing Technology Preparation Planning Proposal were as follows:

1. Establish an articulation agreement and plan with the Chicago Public Schools for operating a Manufacturing Technology Program;
2. Organize the employers and educators as a working group to determine the skills necessary to establish core and industry-specific performance standards;
3. Identify entry and exit criteria for entrance into the program and for advancement at each level (grades 11-14);
4. Determine which skills are best taught and learned in the classroom and which are best taught and learned in the workplace;
5. Convene a Manufacturing Technology Implementation Team;
6. Establish a curriculum committee to develop and articulate a manufacturing

technology curriculum for the CPS and the CCC based on skills and standards identified by the industry;

7. Provide in-service training for both CCC and CPS faculty;
8. Establish the contacts for the workbased learning component; and
9. Build into the program an evaluation component.

Major Accomplishments During FY '91:

During the planning phase of the Manufacturing Technology Preparation Program significant progress has been made. The objectives have been met and can be measured in various stages and dimensions. A planning team comprised of business, industry, government, labor, civic and education representatives has developed the Career Preparation Initiative (CPI) model for the school-to-work transition as a means of meeting the current and near future labor demands for the city of Chicago (See Appendix B). The Career Preparation Initiative uniquely combines the high-school experience with the community colleges and the workplace. The CPI model encompasses and promotes all the components of a Tech Prep program. It is a structured career path that links the high school, the community college and the workplace.

The Productive Chicago Board of Directors represents the partnership that is vital to the success of a Tech Prep Program. The articulation agreement between the City Colleges of Chicago and the Chicago Public Schools is firm. The Labor Market Analysis was completed by the Economic Development Commission of the City of Chicago and subsequently, an Industry Council was established to review and respond to the findings. The Metal Fabrication Industry Council developed a strategic plan for their industry based

on the Council's needs assessment which indicated an immediate need for well trained precision gear manufacturing and multiple spindle screw machining personnel. The Metalworking Implementation Team which consist of staff and faculty from City Colleges of Chicago and Chicago Public Schools, business/industry (EDC's Industry Council) and community based organizations was formed to respond to the educational and training needs required to prepare personnel for this industry. Specific team objectives include:

- Define industry/business hiring standards.
- Develop entry and exit standards for courses, work-based learning experiences. within the industry at the high-school level and degrees for the community college.
- Develop a competency-based curriculum for industry-specific courses for employment and advancement.
- Review position descriptions spanning all aspects of the industry from entry-level to management including entrepreneurial skills.
- Select/develop assessment and evaluation instruments necessary to measure student achievement.
- Develop a structure and network to assist graduates with job placement.

Conclusions

The Tech Prep and CPI are the framework in which the Metalworking I-Team has been working collaboratively to build on the core industry standards being developed by Northern Illinois University. The industry standards will be used to develop, and adjust curriculum for the Chicago Public Schools, and the City Colleges of Chicago. The continuation and implementation plans for the Manufacturing Tech Program is outlined in

the FY'92 Tech Prep Proposal.

Industry standards have been completed. The Metalworking I-Team will continue as the forum to identify and mobilize the resources necessary to retain, upgrade and expand the Manufacturing Technology Industry for the city. Through the support of the implementation team the following accomplishments have been made.

- Daley College, Curie and Westinghouse High Schools have been selected as the sites to start-up the first sub-sector of the Manufacturing Technology for the 2+2 articulation program. The meetings to plan and develop the articulation of the Multiple Spindle Screw Machine curriculum will begin in July (See Appendix H).
- The City Colleges of Chicago Board of Trustees has committed funds necessary to install a machining laboratory and to renovate the space to house the program at Daley College. This process is underway. The layout and work schedule are in Appendix C.
- The Chicago Commons Association with the input of the Multiple Spindle Screw Machine Association has developed a curriculum for the Multiple Spindle Screw Machine sub-sector of Manufacturing Technology. (See Appendix D). It will be submitted to ICCB and ISBH for certification in August.
- Multiple spindle screw machine member companies through their Association have donated several pieces of equipment with an estimated value of 5.5 million dollars.
- Through the Chicago Manufacturing Technology Consortium (IIT Research

Institute, Chicago Department of Economic Development, the Economic Development Commission and Productive Chicago) the funds for hiring a Manufacturing Technology Director have been committed. The Manufacturing Technology Director will oversee the Manufacturing Technology Preparation Program (Resume of final candidate is in Appendix E.)

- A marketing plan for the Tech Prep Program has been developed. A comprehensive outreach will begin September 1 1991 (See Appendix F).
- A plan has been recommended for work-based learning experiences (See Appendix G).
- Interpersonal Skills will be integrated into the standards established by Bob Sheets, Northern Illinois University.

Problems

Major projects are always fraught with incidents. This project was no exception. However, having the support of the Economic Development Commission, the Chicago Commons Association, and the work and activities of Northern Illinois University's Center for Governmental Studies and Bob Sheets made it easier to prevent major stumbling blocks.

Because the City Colleges of Chicago did not have an Associate Degree Program in Manufacturing Technology, to which the Chicago Public Schools could articulate this became a major issue for Fiscal Year 1991. After several meetings, it now appears as though this component of the project can proceed. The Chicago Public Schools and the Illinois Institute of Technology have agreed to begin a series of planning meetings to develop a City Colleges of Chicago Manufacturing Technology Curriculum. Plans also call

for the High Schools to adapt curriculum for preparation for sub-sector, such as Multiple Spindle Screw which will be offered at the community college. This obstacle also prevented full commitment from both institutions for the teachers internships program during the summer. In light of this fact, a concerted effort will be made to ensure that appropriate, comprehensive in-service will be provided during the fall.

Projections call for the high-school component of the Manufacturing Technology Preparation Program to be operational by Fall 1991, specific college level programs in multiple spindle machining and gears will be operational by January 1992, and the comprehensive four year sequence will be operational by Spring 1992.

Recommendations

Because the Metalworking I-Team members have played an integral role in the programs progress to date, the I-Team will continue to be the force that drives this project.

Goal and Objectives for Fiscal Year 1992:

Develop a Manufacturing Technology Articulation Program (specifically Multiple Spindle Screw for start-up January 1, 1992) between the CPS and CCC.

Objectives:

1. Determine the number of sub-sectors to be included in Manufacturing Technology Preparation Program (September 30, 1991).
2. Establish a core curriculum for Manufacturing Technology Preparation Program that will include the integration of academics and technical performance standards (July 30, 1991).
3. Expand the Multiple Spindle Screw curriculum to include the core manufacturing technology courses. These courses will articulate to

community college and reflect integration of academic courses and the performance standards, entrance and exit criteria as identified by industry (July 30, 1991).

4. Identify the instructors that will be involved in program delivery, including science, math and english instructors at both institutions (June30, 1991).

5. Arrange a series of meetings that will promote inter-institutional and inter-disciplinary discussions and planning amongst Daley College, Curie and arrange a series of meetings between faculty and staff at Daley College, in order to promote inter-institutional and inter-disciplinary discussion and planning (September 1, 1991).

6. Plan with the input of CCC and CPS faculty an in-service program that provides the opportunity for math, science, English and technical instructors at tech prep sites to observe and, where possible, obtain hands on experience at one or more manufacturing technology companies, prior to program start-up (July 1, 1991).

7. Develop a plan for faculty internship participants to produce curriculum, case studies, assignments, exam, etc. based on their internship experience on a continuous basis (July 1, 1991).

8. Identify equipment and resources needed to provide quality instruction and workplace simulation (September 1, 1991).

9. Determine the number of instructors and lecturers that will be needed for start-up (October 30, 1991).

10. Establish entrance and exit criteria as identified by industry that will accommodate preparation for entrance into a university, and matriculation

into the corresponding sub-sector.

11. Obtain ICCB program approval for a manufacturing technology program and Advanced certificates in the Multiple Spindle Screw sub-sector (December 1, 1991).

12. Ensure full support from the high school Metalworking Advisory Council for a Manufacturing Technology Tech Prep Program (July 1,1991).

13. Implement the marketing campaign for informing parents, students, teachers, counselors and Local School Councils about Tech Prep (September 1, 1991).

14. Arrange for involvement by appropriate faculty members (September 1, 1991).

15. Establish supportive services for students (January 1, 1992).

16. Provide continuous opportunities for faculty to participate in industry internships in manufacturing technology (March 30, 1992).

17. Establish a plan for the second sub-sector Gears-Manufacturing (September 1, 1991).

    - Obtain an articulation agreement with the high-schools and a four year institution.
    - Obtain market analysis information
    - Establish an Implementation Team
    - Identify college and high-school sites

18. Establish a plan for obtaining workbased learning experiences and recruiting mentors (December 1, 1991).

APPENDICES

Item	Appendix
Metalworking Implementation Team Members Economic Development Commission, Inc. Industry Council	A
Career Preparation Initiative Model	B
Building Renovation Board Report Floor Plan	C
Multiple Spindle Screw Machine Curriculum (Draft)	D
Manufacturing Technology Director Final Candidates Resumés	E
Manufacturing Tech Prep Marketing Plan Board Report for Ogilvy & Mather	F
Plan for Workbased Learning (Draft)	G
Curriculum Articulation	H
Paid Participants: Chicago Common Association Contract	I

APPENDIX A

CAREER PREPARATION INITIATIVE
METALWORKING
IMPLEMENTATION TEAM

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Mr. George Kalidonis
Managing Director
Blackman, Kallick and Bartelstein

Mr. Walter Krzak
Production Manager
Cretors & Co.

Mr. Victor Koerner
President
Economy Plating

Mr. William Lane
President
Kaan Engineering

Ms. Carmen Lomellin
Executive Director
Private Industry Council

Mr. Dave McClenahan
Director of Human Resources
Bodine Electric Co.

Dr. Keith McKee
Director
Manufacturing Productivity Center/IIT

Mr. Larry Murray
Vice President
Heick Die Casting

Mr. Edward O'Connel
Associate
Lester B. Knight

Mr. Gerald Reese
Executive Director
Chicago Assn. of Spring Mfg.

Mr. John Scroger
Vice President of Operations
Joslyn Mfg. Co.

Ms. Ann Seng
President
Chicago Council on Urban Affairs

Ms. Martha Stouffer
Project Manager
North Business & Industry Council

Mr. Jerry Shields
President
Greymills Corp.

Mr. Marvin Wortell
President
Triton Industries, Inc

Economic Development Commission
Metalworking Target
Industry Council Members

Mr. Tim Augustine
Purchasing Manager
Heick Die Casting

Mr. Jim Blackidge
President
Craftsman Plating

Mr. Michael Buccitelli
Director of Targeted Development
Jane Addams Resource Corporation

Mr. Richard Burgess
Director of Industrial Relations
Finkl & Sons Co. Inc.

Mr. Bruce Braker
Executive Vice President
Tooling and Manufacturing Association

Mr. Michael Calendo
Business Representative
International Association of Machinists

Mr. Joe Davis
President
Local 5554, United Steel Workers

Mr. Tom DuBois
Assistant Director of Development
Chicago Department of Economic Development

Mr. Joe Duffy
Vice President of Traffic & Transportation
Ablaze Freight Systems, Inc.

Mr. Jean-Pierre Ergas
Chief Executive Officer
American National Can

Mr. Tom Faul
Business Manager, Local 126
International Association of Machinists

Ms. Sandy Foster
Executive Director
Productive Chicago

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President
Gatto Industrial Platers, Inc.

Mr. Gerald Geren
Hill and Vanasten,
Steadman and Simpson

Mr. Jim Greenwell
President
Reliable Plating

Mr. Rick Gudell
Director of Industrial & Business Training Programs
Chicago Commons Association

Ms. Mary Gonzalez-Koenig
Special Assistant to the Mayor
Mayor's Office of Employment and Training

Ms. Maureen Hellwig
Associate Director
Center for Neighborhood Technology

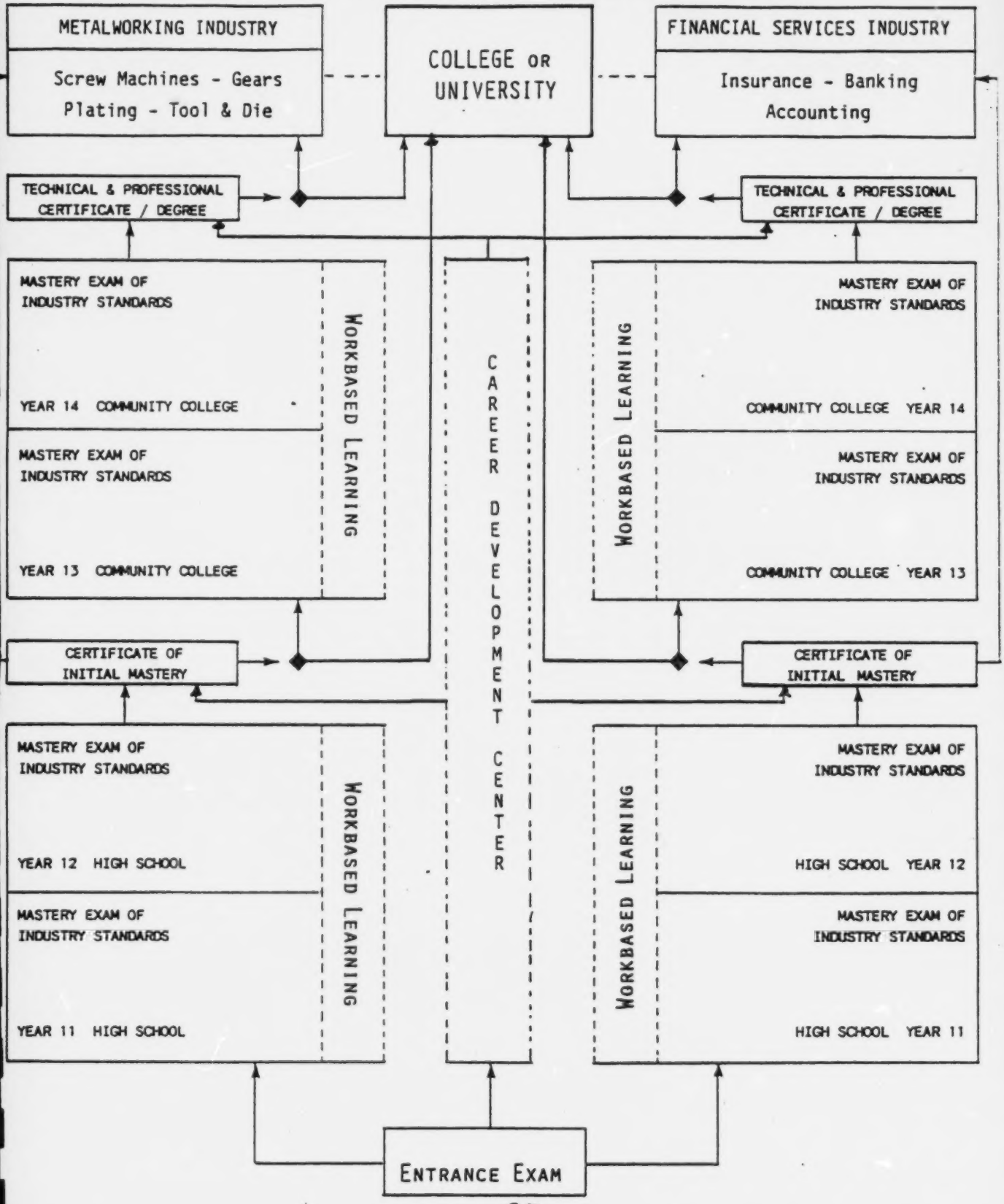
Mr. Joseph James
Commissioner
Department of Economic Development

Ms. Janet Kaiser
President
Century Metal Spinning Co.

APPENDIX B

CAREER PREPARATION INITIATIVE

INDUSTRY-DRIVEN, PERFORMANCE-BASED EDUCATIONAL PROCESS



APPENDIX C

ADOPTED
Board of Trustees of
Community College District No. 508

APR 0 0 1991

15614

COUNTY OF COOK
STATE OF ILLINOIS

BOARD OF TRUSTEES of COMMUNITY COLLEGE DISTRICT NO. 508
County of Cook and State of Illinois

RESOLUTION
CAREER PREPARATION INITIATIVE - METALWORKING PROGRAM
PRODUCTIVE CHICAGO
DALEY COLLEGE

WHEREAS, the metalworking industry is vital to the city's economy and is in need of a prepared workforce, and there is a need to prepare students for employment in fields where jobs are abundant; and

WHEREAS, the City Colleges of Chicago is committed to the development of a metalworking program based on the Productive Chicago Career Preparation Initiative, and research of existing sites has identified Building 300 at Daley College as the most suitable to house equipment appropriate for a metalworking program; and

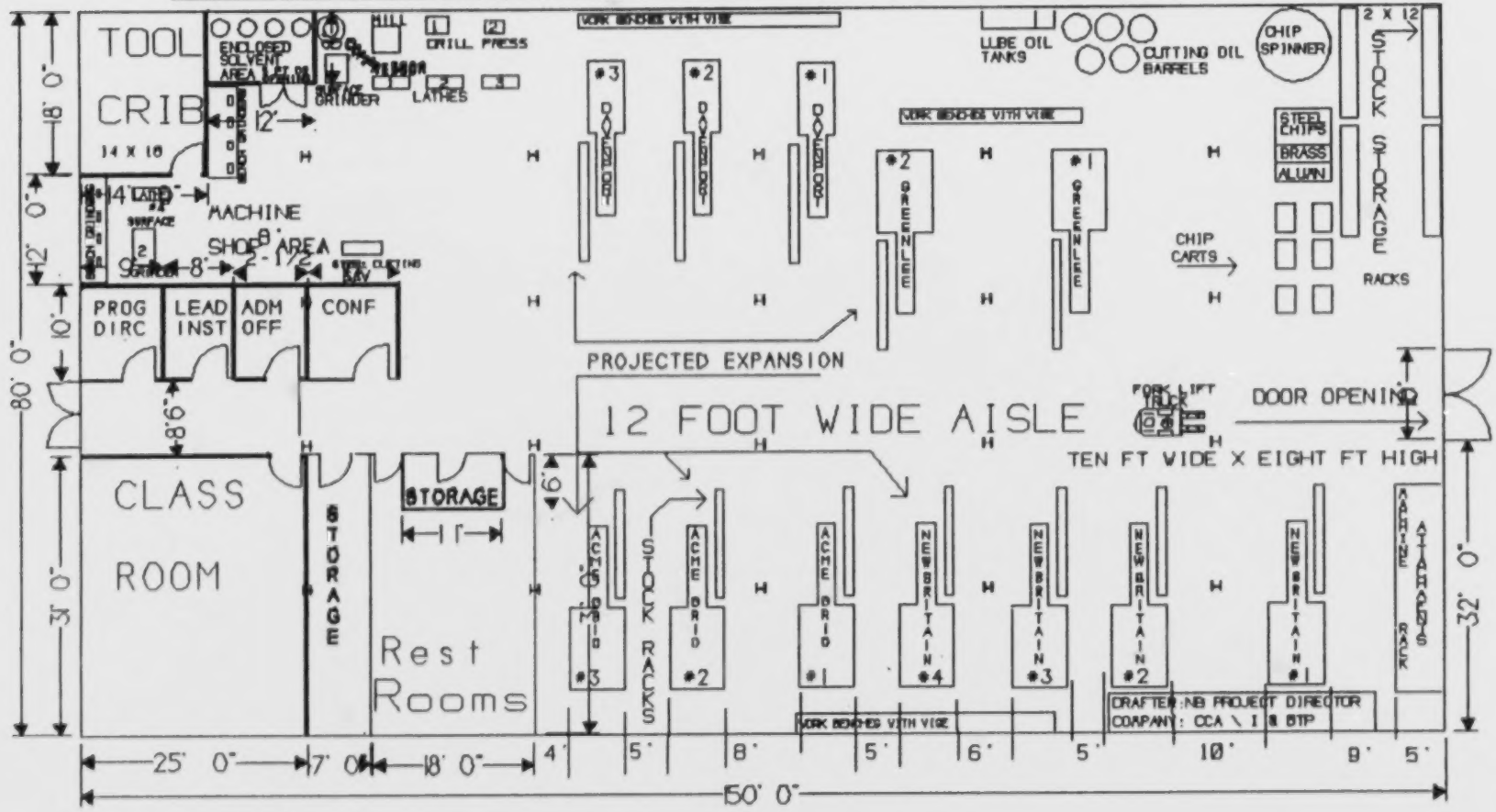
WHEREAS, equipment donations will be made in the amount of $5,034,950 by Chicago Commons Association, the Economic Development Commission, and a consortium of over 50 multiple spindle screw machine manufacturing firms.

NOW THEREFORE BE IT RESOLVED, that the Board of Trustees authorize staff to proceed with preparation of bid documents for space buildout with a total construction budget of $324,000 plus engineering costs, provisions of electrical services, and a 10% contingency; and that equipment and peripheral costs will be in the amount of $620,303; and that the Board of Trustees authorizes staff to prepare necessary applications to ICCB.

BE IT FURTHER RESOLVED, and that the Board of Trustees gratefully acknowledges the commitments that have been made to the City Colleges of Chicago by its partners and further acknowledge their support in planning programs to increase the employability of students.

April 5, 1991

BUILDING 300 DALEY COLLEGE - SQUARE FOOTAGE 12000 DIMENSIONS 150 X 80 FEET FEB 17 1991
REVISED FLOORPLAN LAYOUT DRAFT NO 3 - MSTP APPRENTICE TRADES TRAINING PROGRAM



APPENDIX D

MSTP Curriculum Map

1 - General Description of Curriculum Topics

This section provides a listing of the kinds of general duties performed by a Multiple Spindle Automatic Screw Machine Set-Up Operator

2 - Task Descriptions

This section provides a listing of the tasks that a graduate of the program will be expected to be able to perform.

3 - Learning Objectives for Tasks # 1 through # 10

This section provides samples of the learning objectives related to each of the tasks numbered 1 through 10. This section is incomplete; each learning objective requires a lesson plan , a learning resource module, and a product/performance checklist.

4 - Learning Objective for Task # 11

This section provides an actual learning objective for task numbered 11. This learning objective is complete; the learning objective includes a lesson plan, a learning resource module, and a product/performance checklist.

5 - Learning Objectives for Tasks # 12 through # 32

This section provides completed learning objectives related to tasks numbered 12 through 32. This section is incomplete; each learning objective requires lesson plans, learning resource modules, and a product/performance checklist.

6 - Learning Objectives for Tasks #33 A through 35 F

This section must be written in its entirety.

7 - Contact and Credit Hours

This section provides a listing of our best guess (before running the program) of the time required for students to learn to perform the tasks (contact hours) and of the number of credit hours generated by the time.

8 - This Section Contains Supplementary Information

GENERAL PLAN FOR CURRICULUM

1. Conduct a Job Analysis for the occupation to identify content of training program.
    A. Identify duties
    B. Identify tasks
    C. Sequence and group tasks
    D. Validate tasks

2. Develop a Task Listing Transcript or Competency Profile

3. Write Learning Objectives - Specify Student Population

4. Develop Criterion Referenced Measures - Performance Standards
    A. Written Exams
    B. Product/Performance Checklists

5. Develop Learner Activity Materials
    A. Student Learning Guides/Competency Sheets
    B. Identify Learning Steps
    C. Resources
        1. Texts
        2. Audiovisual
        3. Information Sheets
        4. Activity Sheets
    D. Other Learner Activity Materials

6. Validate Learning Activity Materials
    A. Review by Faculty
    B. Review by Students

7. Complete 6 month, 1 year follow-up on Learning Activity Materials

8. Test and Evaluate the complete Learning Delivery System

1 - General Description of Curriculum Topics

PRODUCTIVE CHICAGO INITIATIVE
RICHARD J. DALEY COLLEGE
City Colleges of Chicago

CHICAGO COMMONS ASSOCIATION
INDUSTRIAL AND BUSINESS
Training Programs Division

Curriculum Topics

DEVELOP JUNIOR OPERATOR/SETTERS

Multiple Spindle Automatic Screw Machine Trade
Entry Level Apprentice Training Program (MSTP)

Objective Listing:

1. Orientation
2. Physical Requirements & Procedures
3. Housekeeping & Safety
4. Work Habits & Attitudes
5. Screw Machine Math
6. Screw Machine Prints
7. Screw Machine Metrology
8. Screw Machine Terminology
9. Tool Crib Familiarization & Procedures
10. Tool Grinding
11. Equipment & Electrical Operations
12. Equipment & Tooling Lubricants
13. Equipment Clutch & Hand Feed Mechanism
14. Service Setting for Bar Stock Size
15. Service Setting for Cycle Time
16. Service Setting for Part Length
17. Service Setting for Accelerating Attachments
18. Service Setting for Die & Tapping Attachments
19. Feeding Out Material
20. Setting Turret Drilling
21. Setting Turret Tool Bits
22. Setting Cross Slide Rough Forming
23. Setting Cross Slide Cut-Off/S
24. Setting Cross Slide Finish Forming
25. Setting Other Turret Finishing Tools
26. Setting Other Cross Slide Finishing Tools
27. Setting Tapping & Accelerating Tools
28. Setting Cross Slide Threading & Knurling
29. Common Problems & Solutions
30. Uncommon Problems & Solutions

New Industry Additions

31. Alcohol & Drug Abuse
32. Industry Apprentice Pre-Enrollment Screening

Advanced Course Objectives

33. Crib/Production/Lathe/ Maintenance/Material
34. SetUps/Counseling/ Clean-Up/Resumes/Tours
35. Threading/Assessments/ SPC/Grinding/Safety/ Check Lists

2 - Task Descriptions

PERFORMANCE TASKS AND TASK PURPOSE DESCRIPTIONS 1 through 11

Objective 1. Orientation

Task: Demonstrate understanding of faculty, facility and purpose of the course in order to follow course objectives efficiently.

Objective 2. Physical Requirements & Procedures

Task: Demonstrate good safety procedures and understand physical requirements a setter\operator will encounter to be able to avoid hazards in training and in the work-place.

Objective 3. Housekeeping & Safety

Task: Demonstrate expected cleaning procedures and safety precautions to be able to work efficiently and avoid accidents in training and in the work-place.

Objective 4. Work Habits & Attitudes

Task: Demonstrate understanding of attendance requirements while in training, learn job placement skills and purpose of plant tours in order to become hired at course completion and maintain employment status.

Objective 5. Screw Machine Math

Task: Demonstrate mathematical skills as it applies to technical machining, mainly working with three place decimals and converting fractions to decimals in order to produce piece parts to print specifications.

Objective 6. Screw Machine Prints

Task: Demonstrate ability to identify piece part tolerances as indicated on blue prints the meaning of different blue print lines and understanding print views in order to maintain production within print specifications.

Objective 7. Screw Machine Metrology

Task: Show ability to use common measuring devices to be able to determine when piece parts are made to blue print specifications.

Objective 8. Screw Machine Terminology

Task: Demonstrate ability to understand technical meaning of words commonly used in the metal trades which have different meanings from what individuals normally interpret the words to mean in order to know what instructors and managers are communicating.

Objective 9. Tool Crib Familiarization & Procedures

Task: Show ability to quickly locate tool crib items needed for training and rules required while obtaining items common to most shop procedures in order to guard against theft and work efficiently.

Objective 10. Tool Grinding

Task: Show ability to sharpen tools in order to properly cut piece parts to specified tolerances and finishes.

Objective 11. Equipment Electrical Operations:

Task: Demonstrate understanding of electrical control operating functions in order to properly operate machine power control panels.

Objective 12. Equipment & Tooling Lubricants:

Task: Demonstrate knowledge of machine oil lubrication systems and cutting tool oil cooling systems in order to maintain machine and tool cutting life expectations.

Objective 13. Equipment Clutch & Hand Feed Mechanism:

Task: Demonstrate knowledge of clutch and hand feed controls in order to place machine cross slides and turret in positions needed to properly stock up, set and/or adjust tooling as machines require.

Objective 14. Service Setting for Bar Stock Size:

Task: Show understanding of how to change collets, feed fingers and adjust collet tension in order to set and operate machine with stock size specified on blue print.

Objective 15. Service Setting for Cycle Time:

Task: Show ability to install gears, cams and time machine to insure tools will cut at specified speeds so that the machine will produce designated number of piece parts per hour as specified on job layout.

Objective 16. Service Setting for Part Length:

Task: Demonstrate understanding of installation of feed pusher cams and determine proper amount of stock needed to be fed out past end of spindle in order to produce proper length piece part as specified on blue print without exceptional amount of material waste.

Objective 17. Service Setting for Accelerating Attachments:

Task: Demonstrate skills required to install special machine tool attachments needed in order to perform drilling or reaming operations that have longer cutting dimensions than what job layout turret cutting travel provides in order to produce piece parts at greater numbers per hour as would normally be possible.

Objective 18. Service Setting for Die & Tapping Attachments:

Task: Show ability to install special machine tool attachments required in order to cut outside and inside piece part threads as specified on blue print.

Objective 19. Feeding Out Material:

Task: Demonstrate understanding of installing bar stock in machine and ability to place machine in correct position for beginning of set up in order to start actual machine tool set up cutting operations.

Objective 20. Setting Turret Drilling:

Task: Show ability to set drills to cut at predetermined cutting lengths in order to cut piece parts to dimensions specified on blue print.

Objective 21. Setting Turret Tool Bits:

Task: Demonstrate ability to set facing tool to cut face of piece part in order to cut piece part length to dimension specified on blue print.

Objective 22. Setting Cross Slide Rough Forming:

Task: Demonstrate ability to set cross slide rough form tools in order to remove excess stock from piece part before finish form cuts piece part in order for finish form to properly hold size specified on blue print and extend cutting life of finish form tool.

Objective 23. Setting Cross Slide Cut-Off\s

Task: Show understanding of setting cross slide cut off tools in order to cut off piece parts to dimensions specified on blue print.

Objective 24. Setting Cross Slide Finish Forming:

Task: Demonstrate ability to set the finishing cuts made with finish forms in order to cut finished dimensions specified on blue print that are cut with finish forming tools.

Objective 25. Setting Other Turret Finishing Tools:

Task: Show mastery of setting other turret finishing tools in order to cut piece parts to dimension tolerances specified on blue print which are cut with turret finishing tools.

Objective 26. Setting Other Cross Slide Finishing Tools:

Task: Demonstrate ability to set other cross slide finishing tools in order to cut piece parts to critical dimension tolerances specified on blue print which are cut with cross slide finishing tools.

Objective 27. Setting Tapping & Accelerating Tools:

Task: Show understanding of setting special tooling cuts made with taps, die heads and reamers which require special attachments in order to cut piece parts to dimensions specified on blue print.

Objective 28. Setting Cross Slide Threading & Knurling:

Task: Show knowledge of setting cross slide thread and knurling cutters in order to cut piece parts to specifications on blue print.

Objective 29. Common Problems & Solutions:

Task: Demonstrate ability to solve common problems which arise when cutting piece parts on automatic screw machines in order to cut piece parts to dimensions and finishes specified on blue print while performing efficiently.

Objective 30. Uncommon Problems & Solutions:

Task: Show ability to solve uncommon problems which arise occasionally on automatic screw machines in order to hold dimensions and finishes specified on blue print while maintaining production expectation standards.

Objective 31. Alcohol & Drug Abuse

Task: Demonstrate ability to maintain requirements of employers and training procedures in relationship to use of alcohol and drugs in order to finish training and become employed and maintain employment status.

Objective 32. Industry Apprentice Pre-Enrollment Screening

Task: Demonstrate knowledge of employers requirements while enrolling in course and fulfilling employers expectations by course ending.

Objective 33 A. Tool Crib Tending:

Task: Demonstrate ability to efficiently distribute tools and other tool crib items; keep a daily record of distribution and acquire return of items at shift end in order to eliminate theft, confusion and lost time when apprentices need crib items.

Objective 33 B. Production:

Task: Demonstrate ability to operate Multiple Spindle Screw Machines at production standards in order to sustain experience requirements of employers.

Objective 33 C. Lathe Work:

Task: Show mastery of lathe machining parts as designated by instructors in order to confirm basic machine knowledge has been acquired.

Objective 33 D. Machine & Shop Maintenance:

Task: Demonstrate ability to repair items as assigned by instructors in order to substantiate repair knowledge needed in most shops.

Objective 33 E. Scrap/Chips & Material Handling:

Task: Show ability to handle material related duties in order to substantiate material handling requirements of most shops.

Objective 34 A. Additional Machine Set-Ups:

Task: Show mastery of expedient set-up experience of screw machines in order to substantiate requirements of all shops.

Objective 34 B. Attendance/Work Habits & Other Counseling NOT related to D & A Abuse:

Task: Demonstrate ability to master any personal problems prior to class ending in order to ensure future employers your work habits will be acceptable.

Objective 34 C. General Work Area & Shop Clean-Up:

Task: Demonstrate ability to clean facility efficiently in order to allow for work efficiency and insure future employer you are competent in cleanliness.

Objective 34 D. Resumes:

Task: Show ability to fill out an acceptable resume in order to fulfill expectations of future employers.

Objective 34 E. In-Plant Shop tours:

Task: Demonstrate ability to acquire knowledge of numerous shops in order to determine effectively future opportunities for employment.

Objective 35 A. Threading :

Task: Show mastery of machine threading on automatic screw machines in order to produce piece parts to blue print specifications.

Objective 35 B. Apprentice Evaluation of Program :

Task: Show ability to assess staff and curriculum being worked with in order to improve facilitation of present and future course objectives.

Objective 35 C. Statistical Process Control (SPC):

Task: Demonstrate ability to apply SPC inspection applications in order to substantiate process has been learned for the use of future employers.

Objective 35 D. Additional Tool Grinding Assignments:

Task: Show mastery of precision and expedient tool grinding in order to ensure efficiency and quality when producing piece parts.

Objective 35 E. General Safety Precautions:

Task: Demonstrate ability to practice safe working habits in order to ensure future employers you know how to avoid hazards.

Objective 35 F. Additional Check Lists:

Task: Show mastery of documented skills required to perform course objectives. This information will be supplied to all potential employers who request the information, provided apprentice signed release forms. Apprentices are encouraged to provide the release of this information.

3 - Learning Objectives for Tasks # 1 through # 10

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
1. Orientation			
A. Introduction to Instructors:	15 min		0.3
B. Introduction to facility: Time cards Wash rooms Class locations Lockers Discussion	40 min		0.8
C. Purpose of Course: Objectives 1 thru 5 Discussion	20 min		0.4
Objectives 6 thru 10 Discussion	30 min		0.6
Objectives 11 thru 13 Discussion	15 min		0.3
Objectives 14 thru 16 Discussion	25 min		0.5
Objectives 17 thru 19 Discussion	20 min		0.4
Objectives 20 thru 23 Discussion	20 min		0.4
Objectives 24 thru 32 Discussion	40 min		0.8

4.5 Contact hours = 0.30 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate understanding of faculty, facility and purpose of course objectives in order to follow course objectives efficiently.

OBJECTIVE # 1. Orientation

Performance	Condition	Criterion
Punch in & out at time clock each scheduled instructional day at hours 7:30 AM & 2:00 PM respectively.	Use time clocks as provided & your Clock # time card provided in time card racks.	(module #?)Time cards will be monitored weekly with 95% as acceptance level.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
2. Physical Requirements & Procedures			
A. Read Safety Manual: Fill out questionnaire	30 min		6
B. Shop Physical Requirements: Moving parts pans Closing collet chucks Loading material Discussion	20 min		.4
Loading equipments oils Installing machine attachments Installing gears Discussion	30 min		6
Back injury examples Discussion Hernias examples Discussion	20 min		4

2.0 Contact Hours = 0.13 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate good safety procedures and understand physical requirements a setter\operator will encounter while in training to be able to avoid hazards.

OBJECTIVE # 2. Physical Requirements & Procedures

Performance	Condition	Criterion
Occasionally lift up to 75 pounds and rarely lift in excess of 50 pounds in difficult work positions.	Read (module #?) and answer questions on work sheet #?	Check answers to work sheet & accept at 97%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
3. House Keeping & Safety			
A. Environment Cleanliness: Shop area efficiency Class room Washrooms Machine area Grinding area Lathe area Tool crib Attachments Stock racks Chip spinning Inspection Discussion	50 min		1.0
B. Safety Precautions: Grinding glasses Machining glasses Hair styles Skin rashes Foot wear Apparel Rings Watches Jewelry Discussion	25 min		.5

1.5 Contact Hours = 0.10 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate expected cleaning procedures and safety precautions while in training to be able to work efficiently and avoid accidents.

OBJECTIVE # 3. House Keeping & Safety

Performance	Condition	Criterion
Clean assigned desk at end of each shift.	Use damp shop towels when necessary. (module #?)	Daily check by training staff,requires reasonable neatness,90%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
4. Work Habits & Attitudes			
A. Attendance Requirements:			
Employer expectations			
Employers reasoning			
Acceptable absenteeism			
Acceptable tardiness			
Unacceptable			
Exceptions			
Providing proof			
Procedures			
Discussion	25 min		.5
B. Plant Site Tours:			
Purpose			
Knowledge gains			
Apparel			
Attitudes			
Safety			
Arrangements			
Number of tours			
Discussion	50 min		1.0
C. Job Placement Skills:			
Meeting requirements			
Locating employment			
Documentation	110 min		2.0
Resumes			
Employment capabilities			
Dependability	160 min		3.0
Tension			
Appearance			
Communication	50 min		1.0
Change adaptability			
Business perceptions			
Personal goals	50 min		1.0

8.5 Contact Hours = 0.57 CREDIT HOURS

INDUSTRIES STATEMENT OF APPRENTICES FUTURE

We hope all students who choose the training program are interested in bettering themselves and preparing for their future. The job of a machinist is not the lowly job it was once thought to be. We want to dispel the stigma attached to the profession, that with proper training a person can provide a better than average living for themselves with the right company. With the right attitude it can be accomplished. What follows is a short summary of a few habits we will expect of our students.

What are the work habits and work attitudes we want to impart through?

TARDINESS:

As in the work place, to be on time is the first sign of a persons dedication to his\her job if you are really concerned about yourself and how you are viewed by others, you will be punctual. If you cannot be on time, you disrupt the class by late entry and you become the center of attention rather than the lesson. It is a habit that must be carried on through life, so learn to do it now!

Tardies will count as an absent day, (beyond three [3] tardies specific format must be adopted). Tardies will apply to all classes.

ABSENCE:

As in the work place, absence is not tolerated. Reoccurring absence without documentation is cause for a counseling meeting to be set up by the class instructor, (at their discretion) with student, instructor and counselor's supervisor. All effort will be made to find out why absence is occurring and what can be done to correct it. If an understanding is reached and absenteeism continues, student will be dismissed. Any student who cares about his/her future will know the rules and abide by them.

STANDARDS FOR EXCUSED ABSENCE:

Prior to beginning of term all students will be asked if there is any reason they cannot be to classes on time on certain days. They may then state their case and at next meeting provide documentation, ie; is responsible for mother\father\sister\brother etc. from x pm\am to x pm\am on this day of week (mon-tue-wed-thurs-fri). Has a job and is not off until x pm\am this day of week (mon-tue-wed-thurs-fri) and so on. Every effort will be made to be fair to all who have outside responsibilities.

EMERGENCIES:

Death in family, accident, sick, court, jail, religious, holidays, bad weather, personal business, outside job etc. All of which will be tolerated with proper excuses prior to absence if possible, or after return. No exceptions made. Some documentation must be provided.

MAKE-UP WORK:

Providing the absence is excused, make-up work will be provided to student by the instructor. The instructor will give a fair amount of time for this work. It is the responsibility of the student to comply.

HOMEWORK:

All assignments must be completed as required. No student will be allowed to pass without doing homework. The knowledge gained through the textbook is necessary to supplement the physical hands on part of the course, one cannot be done without the other. The goal of being on time and not being absent is to develop a work ethic in each individual while still young. Bad habits are hard to break, good habits create pride and show responsibility. There will be no reward for being on time or perfect attendance except the knowledge that the student did what was expected of him\her. All of the above points will be made known to prospective student prior to being accepted into the program. This way they can decide if it is too much responsibility for him\her to handle.

The above information and requirements were provided by the President and Owner of Perfection Screw Products Company Incorporated; Mr. Norris Freedman in cooperation with other participating industries.

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate understanding of attendance requirements while in training, learn job placement skills and purpose of plant tours in order to become hired at course completion and maintain employment status.

OBJECTIVE # 4. Work Habits & Attitudes

Performance	Condition	Criterion
At shift end, use time clocks only after shift bell has sounded.	Time clocks & time card racks as provided.	Staff to check at least twice per week, 90%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
5. Screw Machine Math			
A. Fractional Math:			
Addition	400 min		8.0
Subtraction	400 min		8.0
Multiplication	400 min		8.0
Division	400 min		8.0
Decimal conversion	800 min		16.0
B. Decimal Math:			
Addition	50 min		1.0
Subtraction	50 min		1.0
Multiplication	50 min		1.0
Division	50 min		1.0
Fraction conversion	30 min		.6

52.6 Contact Hours = 3.51 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate mathematical skills as it applies to technical machining, mainly working with three place decimals and converting fractions to decimals in order to produce piece parts to print specifications.

OBJECTIVE # 5. Screw Machine Math

Performance	Condition	Criterion
Read entry level math subject matter and answer questions on work sheet.	Use staff generated material, (module #?)	Check answers on work sheet & determine entry level math status, (12th,G)

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
6. Screw Machine Prints			
A. Identifying Tolerances:			
Outside diameters			
Inside diameters	120 min		2.4
Lengths			
Angles			
Circles	200 min		4.0
Radius surfaces			
Concentricity			
Finishes	440 min		8.0
B. Identifying line types:			
Dashes			
Thickness			
Broken	200 min		4.0
C. Understanding Views:			
Face views			
Back views			
Side views			
Inside views			
Outside views			
Hidden views			
Motion views	440 min		8.0

26.4 Contact Hours = 1.76 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to identify piece part tolerances as indicated on blue prints the meaning of different blue print lines and understanding print views in order to maintain production within print specifications.

OBJECTIVE # 6. Screw Machine Prints & Work Drawings

Performance	Condition	Criterion
Read working drawing and answer questions at end of chapter.	Use hand out 'working drawing' (module #?)	Check answers to 80%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
7. Screw Machine Metrology			
A. Using Precision Instruments:			
Machinists scale	200 min		4.0
Snap gauge			
Ring gauge			
Plug gauge	200 min		4.0
Micrometers	600 min		12.0
Dial veneer	400 min		8.0
Dial caliper	100 min		2.0
Protractor	400 min		8.0
Dial indicator	400 min		8.0

46.0 Contact Hours = 3.08 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show ability to use common measuring devices to be able to determine when piece parts are made to blue print specifications.

OBJECTIVE # 7. Screw Machine Metrology

Performance	Condition	Criterion
Read tools & rules precision measuring & answer questionnaire.	Booklet tools & rules & six inch machinist scale.	Check questioner at 85%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
8. Screw Machine Terminology			
A. Technical term familiarization:			
Collets			
Taps			
Threading	25 min		0.5
Accelerating			
Chucks			
Reaming	25 min		0.5
Boring			
Fingers			
Cams	30 min		0.6
Roll threads			
Dead home	30 min		0.6
Feed tubes			
RPM			
Stock	35 min		0.7
Forming			
Shaving			
Burnishing	40 min		0.8
Approach			
Jog	20 min		0.4
Chips			
Trip dog	15 min		0.3
Crank			
Conveyor	15 min		0.3

4.7 Contact Hours = 0.31 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate understanding of words commonly used in the metal trades which have different meanings from what individuals normally interpret the words to mean in order to know what instructors and managers are communicating.

OBJECTIVE # 8. Screw Machine Terminology

Performance	Condition	Criterion
Listen tut.	ol crib.	Powed twice.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
9. Tool Crib Familiarization and Procedures			
A. Tool Crib Records: Index cards Sign out sheets	40 min		0.8
B. Rules and Procedures: Stock sign out Theft Liabilities Stock returns Hours	50 min		1.0
C. Crib Tenders: Requirements Hours Liabilities	35 min		0.7

2.5 Contact Hours = 0.17 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show ability to quickly locate tool crib items needed for training and rules required while obtaining items common to most shop procedures in order to guard against theft and work efficiently.

OBJECTIVE # 9. Tool Crib Familiarization & Procedures

Performance	Condition	Criterion
Listen to staff presentation & view crib layout.	Class room & tool crib.	Point out viewed discrepancies, same discrepancy allowed twice.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
10. Tool Grinding			
A. Bench Grinders:			
Drills	100 min	600 min	14.0
Reamers	50 min	100 min	3.0
Taps	50 min	150 min	4.0
Tool bits	50 min	100 min	2.0
Cut off blades	25 min	75 min	1.5
Recess tools	75 min	150 min	1.5
Box tools	100 min	250 min	5.0
B. Surface Grinders:			
Circular forms	100 min	100 min	4.0
Shave tools	50 min	100 min	3.0
Dove tail forms	50 min	100 min	3.0

41.0 Contact Hours = 2.7 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show ability to sharpen tools in order to properly cut piece parts to specified tolerances and finishes.

OBJECTIVE # 10. Tool Grinding

Performance	Condition	Criterion
Grind 3/8" center drill to shop standard.	Get 3/8" stub drill from crib/ use medium grit bench grinder(module #?)	Must complete grind in 15 min./-100% with plus or minus 1 deg.
Grind 1/4" tool bit at 45 deg. angle left side & 59 deg. angle right side with 10 deg. rake.	Get 1/4" bit from crib & use medium grit bench grinder (module #?)	Must hold plus or minus 1 deg. on 45 & 59 angles & plus 2 or minus 3 deg. on rake.
Grind 1/2" square tool bit in rough forming shop standard.	Get 1/2" bit at crib and use cross bed surface grinder.	Check shop standard angle to plus or minus 1 deg. 100%

4 - Learning Objective for Task # 11

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
11. Equipment Electrical Operations			
A. Identifying Electrical Components:			
Review CADD drawings	20 min		0.4
Fill out check list			
Spindle power			
Feed engagement			
Jog	20 min		0.4
Conveyor			
Cutting oil control			
Master switch			
Threading switch	20 min		0.4
Automatic shut off			
Discussion	30 min		0.6
Fill out check list			

1.8 Contact Hours = 0.12 CREDIT HOURS

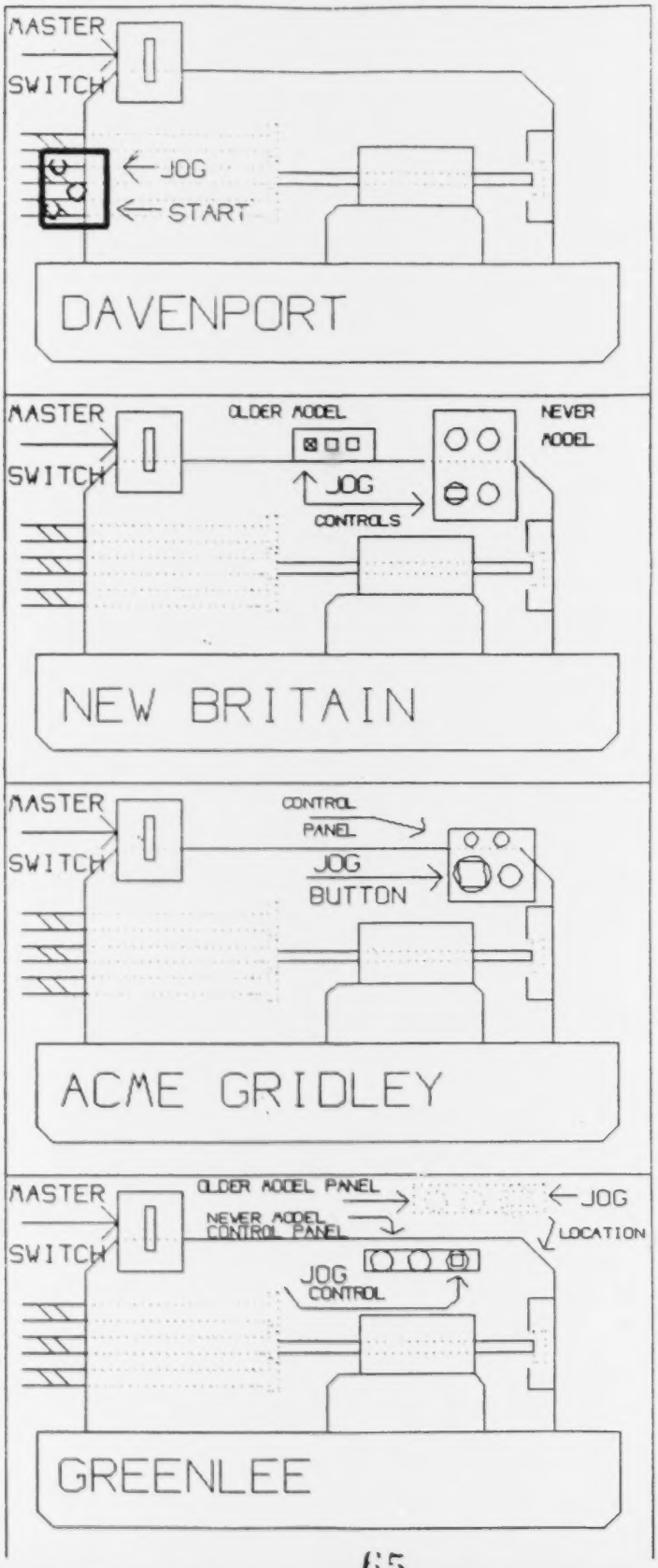
Complete the following objective tasks by using detailed task listings 11-1 and 11-2, use check list/s 11-a and 11-b.

Purpose of objective; Demonstrate understanding of electrical control operating functions in order to properly operate machine power control panels.

OBJECTIVE # 11. Equipment & Electrical Operations

Performance	Condition	Criterion
11-1 Review CADD drawings on machine electrical operations & fill out check list.	CADD drawings entitled electrical components & check list.	Check list 100%
11-2 Attend instructor presentation on machine electrical operations & ask questions to be certain of clear understanding; fill out check list.	Class room & check list.	Check list of machine start up practices 100%

LISTING 11-1 ELECTRICAL COMPONENTS



PERFORMANCE CHECKLIST

CHECKLIST # 11-A

To move on to next module, apprentice must successfully complete 100 % of these steps. Acceptable number (#) of correct answers = 5

ITEMS CORRECT OUT OF 4 =

	Place CHECK MARK in correct column.	YES	NO
1.	Do all multiple spindle machines have a master switch?		
2.	Do all multiple spindle machines have a jog button?		
3.	Are all control panels on multiple machines exactly alike?		
4.	Do all multiple spindle machines have a control panel?		
5.	Does the jog button make the spindle bearings turn?		
6.			
7.			
8.			
9.			
10.			

Apprentice
NAME:_____

DATE:_____

INSTRUCTORS
USE ONLY:
Check Date:_____
Instructor Initials:____

PERFORMANCE CHECKLIST

CHECKLIST # 11-B

To move on to next module, apprentice must successfully complete 100% of these steps. Acceptable number (#) of correct answers = 5

ITEMS CORRECT OUT OF 5 =

	Place CHECK MARK in correct column.	YES	NO
1.	Are master switches installed for safety reasons?		
2.	Should master switches be turned off at end of class?		
3.	Are there any other times master switches should be off?		
4.	Do you need a jog button when setting up a machine?		
5.	Is there anything you need to do before pressing - a machine starting button?		
6.			
7.			
8.			
9.			
10.			

Apprentice
NAME:_____

DATE:_____

INSTRUCTORS
USE ONLY:
Check Date:_____
Instructor Initials:____

5 - Learning Objectives for Tasks # 12 through # 32

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
12. Equipment & Tooling Lubricants			
A. Lubrication Functions:			
Checking equipment lube			
Checking cutting lube		15 min	0.3
Screen cleaning			
Machine start up			
Equipment oil flow			
Cutting oil start up			
Cutting oil flow	30 min	15 min	0.9
Shutting off machine power	50 min		1.0
Filling out check lists			

2.2 Contact Hours = 0.15 CREDIT HOURS

Complete the following objective tasks by using detailed task listings 12-1 through 12-5, use check list/s 12-a through 12-e.

Purpose of objective: Demonstrate knowledge of machine oil lubrication systems and cutting tool oil cooling systems in order to maintain machine and tool cutting life expectations.

OBJECTIVE # 12. Equipment & Tooling Lubricants

Performance	Condition	Criterion
12-1 Check equipment lubricant level & fill out check list.	Use instructor designated machine, machine dipstick, site glass or cover removal procedure as determined by machine type; check list.	Check list 100%
12-2 Check cutting oil level & clean screens prior to machine start up; fill out check list.	Use small hand shovel or metal scraper when necessary & check list.	Check list 100%
12-3 Turn on master switch and push starting button; view lube oil flow by removing cover; fill out check list.	Machine electrical controls & check list.	Check list 100%
12-4 Turn on cutting oil pump & view flow through cutting tool lube lines & fill out check list.	Cutting oil switch or lever control; check list.	Check list 100%
12-5 Turn off machine by pressing stop button & turn off master switch; fill out check list.	Machine electrical controls & check list.	Check list 100%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
13. Equipment Clutch & Hand Feed Mechanism			
A. Familiarization of machine objectives:			
Tool stripping			
Stripping permission			
Machine warm up	15 min		0.3
Half index			
Hand crank			
Safety usage of crank			
Dead home position	20 min		0.4
B. Performing machine objectives:			
Stripping Tools		30 min	0.6
Machine idle		5 min	0.1
Clutch engagement practice		5 min	0.1
Half indexing		10 min	0.2
Hand cranking		15 min	0.3
Achieving dead home		10 min	0.2
C. Filling out check lists:			
Tool stripping	10 min		0.2
Stripping permission	5 min		0.1
Machine warm up	5 min		0.1
Half indexing	5 min		0.1
Hand cranking	10 min		0.2
Dead home	5 min		0.1

3.0 Contact Hours = 0.2 CREDIT HOURS

Complete the following objective tasks by using detailed task listings 13-1 through 13-7, use check list/s 13-a through 13-g.

Purpose of objective: Demonstrate knowledge of clutch and hand feed controls in order to place machine cross slides and turret in positions needed to properly stock up, set and/or adjust tooling as machines require.

OBJECTIVE # 13. Equipment Clutch & Hand Feed Mechanism

Performance	Condition	Criterion
13-1 Check if all tooling has been stripped from machine before starting this objective & fill out check list. **DO NOT CONTINUE UNTIL CHECK LIST HAS BEEN APPROVED BY INSTRUCTOR.**	Use instructor designated machine & check list.	**Check list 100%**
13-2 Strip tooling **AFTER ACQUIRING STAFF PERMISSION** to do so & fill out check list.	Instructor designated machine, wrenches as necessary; check list.	Staff guidance & check list 100%
13-3 Start machine & idle machine until clutch is warm; fill out check list.	Starting button & check list.	Check list 100%
13-4 Start machine, engage & disengage clutch numerous times until familiar with operation; fill out check list.	Start button & feed clutch;check list.	Check list 100%
13-5 Stop machine at half index positions at least 3 times; fill out check list.	Feed clutch & check list.	Check list 100%
13-6 Stop machine & hand crank machine forward & reverse until familiar with hand crank mechanism; fill out check list.	Stop button & hand crank; check list.	Check list 100%
13-7 Start & stop machine at dead home position; fill out check list.	Jog button, feed clutch & hand crank; check list.	Check list 100%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
14. Service Setting for Bar Stock Size			
A. Familiarization of Bar Size Setting:	15 min		0.3
Changing collets	10 min		0.2
Changing feed fingers	15 min		0.3
Adjusting collet tension			
B: Performing Bar Size Setting:			
Changing collets		250 min	5.0
Changing feed fingers		150 min	3.0
Adjusting collet tension		75 min	1.5
C: Filling Out Check Lists:			
Correct collet size	10 min		0.2
Correct finger size	10 min		0.2
Correct tension	15 min		0.3

13.0 Contact Hours = 0.73 CREDIT HOURS

Complete the following objective tasks by using detailed task listings 14-1 through 14-3, use check list/s 14-a.

Purpose of objective: Show understanding of how to change collets, feed fingers and adjust collet tension in order to set and operate machine with stock size specified on blue print.

OBJECTIVE # 14. Service Setting for Bar Stock Size.

Performance	Condition	Criterion
14-1 Change six collet's to size specification indicated on layout.	Use instructor designated machine, six collet's & job layout.	Check list after completion of all 3 objectives.
14-2 Change six feed fingers to size indicated on layout.	Designated machine, large hammer, blunt punch & bench vise.	Check list after completion of next objective.
14-3 Adjust collet tension on spindle # 1 & fill out check list.	Use bar end of correct stock size & check list.	Check list 100%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
15. Service Setting for Cycle Time			
A. Familiarization of Cams, Gears, Brakes:			
Determining cycle times	400 min		8.0
Spindle gears	50 min		1.0
Feed gears	50 min		1.0
Lead cams	40 min		0.8
Stroke clutches	30 min		0.6
Turret brakes	40 min		0.8
Cross slide cams			
B: Changing Cams\Gears\Brakes:			
Spindle gears		100 min	2.0
Feed gears		75 min	1.5
Lead cams\strokes		135 min	1.8
Brakes		100 min	2.0
Cross slide cams		150 min	3.0
C: Fill Out Check List:			
Cycle times	100 min		2.0
Cams\stroke	15 min		0.3
Gears	10 min		0.2
Brakes	10 min		0.2

23.0 Contact Hours = 1.53 CREDIT HOURS

Complete the following objective tasks by using detailed task listings 15-1 through 15-7, use check list/s 15-a.

Purpose of objective; Show ability to install gears, cams and time machine to insure tools will cut at specified speeds so that the machine will produce designated number of piece parts per hour as specified on job layout.

OBJECTIVE # 15. Service Setting for Cycle Time.

Performance	Condition	Criterion
15-1 Change spindle gears to layout specifications.	Gears in gear rack, layout, wrench & hammer.	Check list after completion of 15-1 through 15-6.
15-2 Change feed gears to layout specs.	Gears in gear rack, layout, wrench & hammer.	As above.
15-3 Change lead cam or clutch setting to layout specs. check roller clearance on cam models.	Use cams provided in lead cam rack, hammer, allen wrench, lead cam roller or clutch wrench on clutch models & layout.	As above.
15-4 Set turret brake to lead cam approach indicated on layout & turret tension stop on some models.	Use wrenches and hand crank to determine proper tension settings.	As above.
15-5 Change cross slide cams as indicated on layout & check roller clearance on some models.	Use cams in rack and drum holder on some models & layout.	As above.
15-6 Jog machine slowly through index cycle to be certain machine does not hang up or bind.		
15-7 Turn on machine & engage clutch, check cycle time to layout specs.	Use precision stop watch or read index readout if computerized.	Check list 15-a & instructor should check machine cycle time.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
16. Service Setting for Part Length			
A. Familiarization of Bar Feed Mechanism:			
Determining feed length	50 min		1.0
Stock pushers	25 min		0.5
Safety cycles	10 min		0.2
B: Determining and Setting Feed Length:			
Determine length	30 min		0.6
Set bar stop	20 min		0.4
Determine push length	15 min		0.3
Install push cams	30 min		0.6
Perform safety cycle	10 min		0.2
C: Fill Out Check List:			
Determining length	20 min		0.4
Bar stop setting	15 min		0.3
Push length	10 min		0.2
Push cams	10 min		0.2
Safety cycle	10 min		0.2

5.1 Contact Hours = 0.34 CREDIT HOURS

Complete the following objective tasks by using detailed task listings 16-1 through 16-3, use check list/s 16-a.

Purpose of objective; Demonstrate understanding of installation of feed pusher cams and determine proper amount of stock needed to be fed out past end of spindle in order to produce proper length piece part as specified on blue print without exceptional amount of material waste.

OBJECTIVE # 16. Service Setting for Part Length

Performance	Condition	Criterion
16-1 Determine feed out length & set feed out stop to proper length.	Use layout, blue print, machinists scale & wrenchs.	Complete steps 16-1 through 16-3 before filling out check list.
Install or remove stock pusher cams to insure proper feed push length.	Stock feed cam rack & wrenches.	As above.
Cycle machine for more than one index slowly to ensure setting is correct; start process by jogging & fill out check list.	Use instructor assigned machine & check list.	Check list 16-a.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
17. Service Setting for Accelerating Attachments			
A. Familiarization of Accelerating Mechanism:			
Lead cam approach	25 min		0.5
Accelerator drivers	50 min		1.0
Accelerator cams	50 min		1.0
Accelerator indexing	10 min		0.2
Jog trials	10 min		0.2
Speed trials	15 min		0.3
Other machine brackets	50 min		1.0
B: Determining and Installing Accelerators:			
Other machine brackets		100 min	2.0
Lead cam approach		20 min	0.4
Accelerator cam		50 min	1.0
Jog safety check		30 min	0.6
Speed adjusting		30 min	0.6
C: Fill Out Check List:			
Machine brackets	20 min		0.4
Lead approach	10 min		0.2
Accelerator cams	10 min		0.2
Jog checks	15 min		0.3
Speed adjustments	15 min		0.3

10.2 Contact Hours = 0.68 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate skills required to install special machine tool attachments needed in order to perform drilling or reaming operations that have longer cutting dimensions than what job layout turret cutting travel provides in order to produce piece parts at greater numbers per hour as would normally be possible.

OBJECTIVE # 17. Service Setting for Accelerating Attachments

Performance	Condition	Criterion
Set machine lead cam roller 1/4" past lead cam approach.	Machine start-stop control, clutch, hand crank.	Complete objective then fill out check list.
Install accelerator cam on accelerator driving mechanism.	Utility cam rack and wrenches.	As above.
Index machine slowly to be certain cam is working freely.	Jog button & feed clutch.	As above.
Operate machine in dry run slowly, then check at operating speed.	Starting buttons and hand clutch.	As above.
Fill out check list.	Check list.	Check list 90% acceptable.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
18. Service Setting for Die & Tapping Attachments			
A. Familiarization of Threading Mechanism:			
Lead cam	15 min		0.3
Tap pusher cam	20 min		0.4
Threading time	15 min		0.3
Jog safety check	15 min		0.3
Speed run	10 min		0.2
Check list	10 min		0.2
B: Installing Tapping Mechanism:			
Lead cam approach		15 min	0.3
Tap pusher cam		30 min	0.6
Jog safety check		15 min	0.3
Timing adjustments		20 min	0.4
Speed check		10 min	0.2
Timing adjustments		50 min	1.0
C: Fill Out Check List:			
Lead cam Type pusher Safety check Speed Check	10 min		0.2
Timing	20 min		0.4

5.1 Contact Hours = 0.34 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show ability to install special machine tool attachments required in order to cut outside and inside piece part threads as specified on blue print.

OBJECTIVE # 18. Service Setting for Die & Tapping Attachments

Performance	Condition	Criterion
Set machine lead cam roller 1/4" past lead cam approach.	Machine start-stop control, clutch, hand crank.	Fill out check list after completing objective. 75% acceptable.
Place tap push cam at starting position.	Hand crank and tap push cam.	As above.
Jog machine through safety check to be certain machine does not hang up.	Jog button and clutch engagement.	As above.
Speed check machine to be certain tapping attachment does not move forward while machine is in fast approach cycle.	Starting button and clutch engagement.	Fill out check list. 75% acceptable.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
19. Feeding Out Raw Material			
A. Familiarization of Raw Material Feed:			
Selecting stock size	15 min		0.3
Number one tube	10 min		0.2
Opening collet	15 min		0.3
Bar flush with collet	10 min		0.2
Machine position	15 min		0.3
B: Installation of Stock:			
Finding stock		30 min	0.6
Opening collet			
Pushing out stock		15 min	0.3
Cycling machine		10 min	0.2
C: Fill Out Check List:			
Stock type			
Stock feed distance	10 min		0.2
Stock pushing			
Machine cycle	10 min		0.2

2.8 Contact Hours = 0.19 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate understanding of installing bar stock in machine and ability to place machine in correct position for beginning of set up in order to start actual machine tool set up cutting operations.

OBJECTIVE # 19. Feeding Out Material

Performance	Condition	Criterion
Place correct size bar stock in spindle # 1 stock tube.	Use blue print & stock in stock rack.	Fill out check list after completing objective. 90% acceptable.
Open collet and push bar stock through until flush with front of collet.	Collet opening lever & heavy pound bar.	As above.
Cycle machine until stock feeds to bar stop & stop machine at just past half index.	Starting controls & feed clutch.	Fill out check list. 90% acceptable.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
20. Setting Turret Drilling			
A. Familiarization of Drilling Distance:			
Center drill distance	15 min		0.3
Holder centers	15 min		0.3
Drilling distance	20 min		0.4
Jog cutting	15 min		0.3
Cut recheck	10 min		0.2
B: Installing Drills:			
Center drill		50 min	1.0
Centering holders		20 min	0.4
Other drills		110 min	2.0
Jog cuts		50 min	1.0
Rechecks		20 min	0.4
C: First Piece Inspection:			
Prior questions	50 min		1.0
Critical part check	50 min		1.0

8.3 Contact Hours = 0.55 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show ability to set drills to cut at predetermined cutting lengths in order to cut piece parts to dimensions specified on blue print.

OBJECTIVE # 20. Setting Turret Drilling

Performance	Condition	Criterion
Set center drill in first position of machine turret & secure tool.	Use Boyer & Schultz holder, proper wrenches.	Submit part to staff when set up is completed for first piece part inspection O.K.
Move drill holders into position that will insure proper length of drill cut.	Use machinists scale and turret tension stop rod as length guide.	As above.
Jog machine until cutting cycle starts and center drill holder.	Use judgement and necessary tools.	As above.
Jog machine through rest of cutting cycle.	Jog button & feed clutch.	As above.
Slowly index machine to half index position and recheck cut.	Jog button and machinists scale.	Finale first piece part must receive inspection O.K.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
21. Setting Turret Tool Bits			
A. Familiarization of Tool Bit Settings:			
Bit holders	15 min		0.3
Home position	15 min		0.3
Installing holder	15 min		0.3
Setting center	15 min		0.3
Jogging cut	20 min		0.4
B: Setting Machine Cutting:			
Finding holder		20 min	0.4
Holder set up		20 min	0.4
Home position		20 min	0.4
Holder installation		20 min	0.4
Holder positioning		10 min	0.2
Tool height		15 min	0.3
Implement cut		15 min	0.3
C: Work Acceptance:			
Instrumentation checks		30 min	0.6
Visual checks		20 min	0.4

5.0 Contact Hours = 0.33 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to set facing tool to cut face of piece part in order to cut piece part length to dimension specified on blue print.

OBJECTIVE # 21. Setting Turret Tool Bits

Performance	Condition	Criterion
Set 3/8" tool bit in turret face tool holder.	Ground 3/8" square tool bit & face holder.	Complete objective and ask staff opinion of piece part cut if necessary.
Bring machine to 1/64" of dead home position.	Jog button & hand crank.	As above.
Install tool holder & bring front of bit flush with bar, set tool bit height.	Wrenches. tool & bit holder.	As above.
Jog machine & hand crank machine until past dead home position.	Jog button & hand crank.	Must meet first piece part inspection OK at set up completion.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
22. Setting Cross Slide Rough Forming			
A. Familiarization of Cross Forming:	10 min		0.2
Installing form	15 min		0.3
Centering tool	20 min		0.4
Installing holder	20 min		0.4
Cutting approach	20 min		0.4
Start of cut	15 min		0.3
Rechecking center	15 min		0.3
Cutting process	15 min		0.3
Checking size	20 min		0.4
Determine size	10 min		0.2
Securing process			
B: Cutting piece part:			
Tool installation		30 min	0.6
Centering tool		20 min	0.4
Holder installation		20 min	0.4
Setting cut approach		30 min	0.6
Cutting start		20 min	0.4
Re-centering		20 min	0.4
Cutting process		15 min	0.3
Checking size		15 min	0.3
Secure tool		10 min	0.3
Secure holder		10 min	0.3
C: Work acceptance:			
Instrumentation checks		20 min	0.4
Visual checks		20 min	0.4

8.0 Contact Hours = 0.53 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to set cross slide rough form tools in order to remove excess stock from piece part before finish form cuts piece part in order for finish form to properly hold size specified on blue print and extend cutting life of finish form tool.

OBJECTIVE # 22. Setting Cross Slide Rough Forming

Performance	Condition	Criterion
Set rough form in second position form holder at estimated height.	Use layout to determine correct form tool & holder.	Complete objective and ask staff opinion of piece part cut if necessary.
Place form holder in machine 2nd position & bring machine to 1/4" past start of lead cam.	Jog button & feed clutch.	As above.
Bring tool forward to start of cutting position & re-center tool if necessary.	Jog button & wrenches.	As above.
Start tool cutting process & check size intermittently.	Jog button & micrometer.	As above.
Bring cutting surface to approximately .010" oversize & tighten tool & holder securely.	Micrometer & wrenches.	Finished piece part must pass inspection OK.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
23. Setting Cross Slide Cut-Off/S			
A. Familiarization of Cut-Off Tooling:			
Inserting tool	15 min		0.3
Tool distance	20 min		0.4
Cut length	20 min		0.4
Home position	10 min		0.2
Lead cam start	10 min		0.2
Installing holder	20 min		0.4
Tool distance	15 min		0.3
Centering	30 min		0.6
Machine cycle	50 min		1.0
B: Cutting piece part:			
Insert tool		20 min	0.4
Set tool length		15 min	0.3
Bring machine home		15 min	0.3
Lead cam check		10 min	0.2
Install holder		30 min	0.6
Set blade length		20 min	0.4
Cycle machine cut		25 min	0.5
C: Finale Check of Objective:			
Visual check		10 min	0.2
Instrumentation check		15 min	0.3

7.0 Contact Hours = 0.46 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show understanding of setting cross slide cut off tools in order to cut off piece parts to dimensions specified on blue print.

OBJECTIVE # 23. Setting Cross Slide Cut-Off/S

Performance	Condition	Criterion
Place cutoff in holder 1/4" further than designated length of cut.	Cutoff blade, holder, print & layout.	Compete objective and request staff assistance if necessary.
Bring machine to home position with lead cam roller at start of lead cam slow rise.	Jog button & feed clutch.	As above.
Set cutoff holder in machine with blade approximately 1/16" short of touching part & center tool.	Cutoff tool & holder.	As above.
Jog machine through cutting cycle very slowly and disengage feed clutch if machine hits high before piece part is cut off.	Jog button and feed clutch.	Piece part must pass inspection OK when completed.
Move cut off holder forward of backward untill cut-off blade is just past required full cutting position.	Jog button if steel remains uncut, wrenchs & vis	

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
24. Setting Cross Slide Finish Forming			
A. Familiarization of Finish Form Cutting:	15 min		0.3
Half index	20 min		0.4
Installing tool	20 min		0.4
Installing holder	15 min		0.3
Dead home jog	15 min		0.3
Tool forwarding	20 min		0.4
Tool centering	15 min		0.3
Jog cutting	15 min		0.3
Half index check			
B: Finish Form Cutting:			
Half indexing		15 min	0.3
Tool installation		20 min	0.4
Holder installation		25 min	0.5
Jog dead home		10 min	0.2
Forward tool		15 min	0.3
Center tool		25 min	0.5
Jog cut		20 min	0.4
Check half index		20 min	0.4
C: Work acceptance:			
Visual check		15 min	0.3
Instrumentation check		20 min	0.4

6.4 Contact Hours = 0.43 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to set the finishing cuts made with finish forms in order to cut finished dimensions specified on blue print that are cut with finish forming tools.

OBJECTIVE # 24. Setting Cross Slide Finish Forming

Performance	Condition	Criterion
Bring machine to half index with rough form cut about to enter finish forming position.	Jog button & feed clutch.	Complete objective.
Install finish form & form holder in machine far enough back so as not to cut in cutting cycle.	Tool, holder, wrenches & machine.	As above.
Jog machine to dead home position.	Jog button, feed clutch & hand crank.	As above.
Move tool & holder forward up to material & center tool.	Proper wrenches.	As above.
Jog machine spindles & move tool forward until proper cut size is achieved.	Jog button, micrometer & wrenches.	As above.
Bring machine to half index, make any visual tool adjustments & tighten tool & holder securely.	Micrometer & wrenches.	Piece part must pass inspection OK when competed.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
25. Setting Other Turret Finishing Tools			
A. Familiarization of Finish Reaming:	15 min		0.3
Proper tool position	10 min		0.2
Half indexing	20 min		0.4
Installing reamer	20 min		0.4
Installing ream holder	25 min		0.5
Installing turret holder	25 min		0.5
Lead cam positioning	25 min		0.5
Cutting distance	15 min		0.3
Forwarding reamer	20 min		0.4
Jog cutting			
B: Performing ream cutting:			
Position machine		15 min	0.3
Install reamer		30 min	0.6
Install ream holder		30 min	0.6
Install turret holder		30 min	0.6
Position lead cam		20 min	0.4
Set cutting distance		20 min	0.4
Forward tool		15 min	0.3
Jog cut		20 min	0.4
C: Work Acceptance:			
Visual check		10 min	0.2
Instrumentation check		15 min	0.3

7.6 Contact Hours = 0.51 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show mastery of setting other turret finishing tools in order to cut piece parts to dimension tolerances specified on blue print which are cut with turret finishing tools.

OBJECTIVE # 25. Setting Other Turret Finishing Tools

Performance	Condition	Criterion
Position machine to half index before position to be reamed as called for in layout.	Jog button & layout.	Complete objective.
Place reamer in reamer holder, place reamer holder in turret holder & place all holders in proper machine position.	Reamer, reamer holder, turret holder & machine.	As above.
Jog machine forward until lead cam has only proper cutting distance left to travel.	Jog button, turret stop rod & machinists scale.	As above.
Place reamer cutting edge to start of part to be cut; secure tooling & jog machine through cut.	Jog button, feed clutch & wrenches.	Piece part must pass inspection OK when completed.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
26. Setting Other Cross Slide Finishing Tools			
A. Familiarization of Precision Shaving:	20 min		0.4
Installing tool	10 min		0.2
Tool tightening	20 min		0.4
Machine positioning	20 min		0.4
Holder installation	30 min		0.6
Low feed positioning	25 min		0.5
Moving cross slide	25 min		0.5
Setting roller rise	10 min		0.2
Jog cutting	15 min		0.3
Checking cut diameter	15 min		0.3
Making adjustments			
B: Performing Shaving Cut:			
Install tool		20 min	0.4
Position machine		15 min	0.3
Install holder		20 min	0.4
Position approach		30 min	0.6
Forward cross slide		30 min	0.6
Set roller rise		20 min	0.4
Jog cut		20 min	0.4
Check diameter		15 min	0.3
Make adjustments		25 min	0.5
C: Work Acceptance:			
Visual check		15 min	0.3
Instrumentation check		20 min	0.4

8.4 Contact Hours = 0.56 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to set other cross slide finishing tools in order to cut piece parts to critical dimension tolerances specified on blue print which are cut with cross slide finishing tools.

OBJECTIVE # 26. Setting Other Cross Slide Finishing Tools

Performance	Condition	Criterion
Set shave tool flush to end of shave tool holders head & tighten tool very securely	Layout, shave tool & holder.	Finish objective.
Index machine to just before position layout calls for shave tool.	Jog button, feed clutch & layout.	As above.
Place shave holder in machine & jog machine to just past high feed position.	Jog button & feed clutch.	As above.
Pull cross slide down until face of shave tool hits piece part & set shave roller rise to be about .125".	Three foot bar.	As above.
Jog machine through cycle for shave tool cut.	Jog button & feed clutch.	As above.
Check shave cut diameter at half index and check taper.	Blue print and/or layout and micrometer.	As above.
Make necessary adjustments and tighten holder securely.	Wrenches.	Piece part must pass inspection OK after completion.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
27. Setting Tapping & Accelerating Tools			
A. Familiarization of Ream Acceleration:	20 min		0.4
Machine positioning	15 min		0.3
Reamer installation	15 min		0.3
Holder installation	30 min		0.6
Travel distance	15 min		0.3
Jog cutting			
B: Performing Accelerating Cut:			
Position machine		20 min	0.4
Install reamer		20 min	0.4
Install holder		30 min	0.6
Set travel distance		25 min	0.5
Position reamer		10 min	0.2
Secure tooling		15 min	0.3
Jog cut		15 min	0.3
C: Work Acceptance:			
Visual check		15 min	0.3
Instrumentation check		20 min	0.4

5.3 Contact Hours = 0.35 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show understanding of setting special tooling cuts made with taps, die heads and reamers which require special attachments in order to cut piece parts to dimensions specified on blue print.

OBJECTIVE # 27. Setting Taping & Accelerating Tools

Performance	Condition	Criterion
Bring machine to half index just before position to be accelerate reamed.	Jog button & feed clutch.	Finish objective.
Place reamer in reamer holder & place reamer holder in accelerating arm.	Reamer, reamer holder & layout.	As above.
Jog machine until remaining travel distance of accelerating arm is desired length of cut.	Jog button, feed clutch, machinists scale & layout.	As above.
Move reamer to start of cut position, secure tooling & jog machine through cutting cycle.	Jog button, feed clutch & wrenches.	Piece part must pass inspection OK upon completion.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
28. Setting Cross Slide Threading & Knurling			
A. Familiarization of Knurling Process:	15 min		0.3
Knurl installation	10 min		0.2
Machine positioning	20 min		0.4
Holder installation	10 min		0.2
Dead home positioning	10 min		0.2
Knurl positioning	20 min		0.4
Centering	20 min		0.4
Knurl tension	20 min		0.4
Knurl rise	10 min		0.2
Half indexing	15 min		0.3
Visual inspection	20 min		0.4
Additional adjusting			
B: Performing Knurl Operation:			
Install knurl		25 min	0.5
Position machine		15 min	0.3
Install holder		30 min	0.6
Set home position		15 min	0.3
Position knurl		20 min	0.4
Center knurl		15 min	0.3
Set knurl tension		15 min	0.3
Half index machine		10 min	0.2
Inspect visually		15 min	0.3
Make other adjustments		30 min	0.6
C: Work Acceptance:			
Visual inspection		15 min	0.3
Instrumentation inspection		20 min	0.4

7.9 Contact Hours = 0.53 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show knowledge of setting cross slide thread and knurling cutters in order to cut piece parts to specifications on blue print.

OBJECTIVE # 28. Setting Cross Slide Threading & Knurling

Performance	Condition	Criterion
Set knurl tools in knurl holder at approximate knurl diameter.	Knurl tools, knurl holder & layout.	Complete objective.
Bring machine to half index to just before position to be knurled.	Jog button, feed clutch & layout.	As above.
Set knurl & holder in cross slide & jog machine to dead home position.	Jog button, feed clutch & layout.	As above.
Move knurl forward until centered to straddle piece part.	Wrenches & layout.	As above.
Adjust knurl tension until desired knurl rise is obtained.	Wrenches & print.	As above.
Bring machine to half index, view part & make any necessary preliminary adjustments.	Jog button, feed clutch & print.	Piece part must pass inspection OK upon completion.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
29. Common Problems & Solutions.			
A. Familiarization of Many Common Piece Part Cutting Problems & Common Solutions:	30 min		0.6
Forming chatter	30 min		0.6
Tool angle clearances	25 min		0.5
Excessive tapers	20 min		0.4
Rough grooving cuts	40 min		0.8
Size variations	30 min		0.6
Cutting burrs	45 min		0.9
Rough finishes	45 min		0.9
Hole tapering	70 min		1.4
Concentricity run-out			
B: Correcting Commonly Encountered Piece Part Cutting Problems:			
Low center		45 min	0.9
Excessive cut-angle		60 min	1.2
Turret tool centers		120 min	2.4
Grooved cuts		50 min	1.0
Size variation		500 min	10.0
Excessive burr		120 min	2.4
Rough finish		120 min	2.4
Hole taper		180 min	3.6
Eccentric cut		400 min	8.0
C: Work Acceptance:			
Visual inspection		480.0	9.6
Instrumentation inspection		600.0	12.0

60.2 Contact Hours = 4.01 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to solve common problems which arise when cutting piece parts on automatic screw machines in order to cut piece parts to dimensions and finishes specified on blue print while performing efficiently.

OBJECTIVE # 29. Common Problems & Solutions.

Performance	Condition	Criterion
Cross Slide Forming Chatter: Determine Cause: Raise center of form tool a few thousands of an inch to remove form tool chatter.	Wrenches & square scale.	Complete objective & request staff guidance only if necessary.
Cut off piece part & view cut.	Starting controls & feed clutch.	As above.
Make any necessary further adjustments.	Print & wrenches.	Piece part must pass inspection OK when completed.
Cross Slide Forming Chatter: Determine Cause Continued: Excessive tool cut clearance; remove tool & check clearance angle.	Wrenches & protractor.	Complete objective.
Re-sharpen tool to proper angle.	Grinding equipment provided for the designated tool.	As above.
Install tool & cut-off additional piece part.	Machine controls & wrenches.	Piece part must pass inspection OK upon completion.
OTHER COMMON PROBLEMS: Forming taper; grove cuts; size variation; hex burrs; other burrs.	Machine controls, wrenches & precision measuring instruments.	Piece part must pass inspection OK upon completion.
Inside diameters over and/or undersize; rough hole finish; tapered hole; eccentric hole.	Machine controls, wrenches & precision measuring instruments.	Piece parts must pass inspection OK upon completion.
As an apprentice you will encounter numerous tool cutting problems which will need to be solved through the use of your newly acquired machinist skills. **YOU MUST ATTEMPT TO P R O B L E M S O L V E U N S A T I S F A C T O R Y CONDITIONS PRIOR TO REQUESTING ASSISTANCE IN ORDER TO FURTHER DEVELOP M A C H I N I N G S E L F CONFIDENCE.**	Machinist tools, various measuring instruments, co-apprentice assistance, limited staff assistance & a lot of trial & error encounters.	**Twelve piece parts cut-off the machine consecutively must pass final inspection before set-up completion OK becomes acceptable as objective completion.**

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
30. Un-Common Problems & Solutions.			
A. Familiarization of Some Un-Common Problems & Some Common Solutions:	30 min		0.6
Broken chuck pins	30 min		0.6
Worn pressure stops	15 min		0.3
Worn spindle bearings	20 min		0.4
Worn slide roller	10 min		0.2
Worn slide pin	25 min		0.5
Worn threading clutch	20 min		0.4
Worn feed clutch			
B: Correcting Un-Common Problems: **STAFF PERMISSION REQUIRED PRIOR TO CORRECTING unusual problems.**			
Replace chuck pins		200.0 min	4.0
Replace pressure stops		200.0 min	4.0
Replace spindle bearings		1200.0 min	24.0
Replace slide rollers		150.0 min	3.0
Replace slide pins		150.0 min	3.0
Replace threading clutch		1200.0 min	24.0
Replace feed clutch		1200.0 min	24.0
C: Work Acceptance:			
Visual inspection		100.0 min	3.0
Instrumentation inspection		100.0 min	3.0
Working with staff inspection		100.0 min	3.0

98.0 Contact Hours = 6.53 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Show ability to solve uncommon problems which arise occasionally on automatic screw machines in order to hold dimensions and finishes specified on blue print while maintaining production expectation standards.

OBJECTIVE # 30. Un-Common Problems & Solutions.

Performance	Condition	Criterion
Replace worn trip dog of tap cut length tripping mechanism.	Wrenches & trip dog.	Complete objective.
Cut several piece parts to determine if problem is solved.	Starting controls & feed clutch.	Proper tap depth cut on all spindles.
Other un-common problems: chuck pins; pressure stops; spindle bearings; slide rollers; slide pins; threading clutches; feed clutches.	Assortment of machinist wrenches and precision instrumentation.	Staff guidance, equipment operating properly and piece part inspection OK.

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
31. Alcohol & Drug Abuse.			
A. Familiarization of Addictions:			
Alcohol	30 min		0.6
Drugs	20 min		0.4
B: Preventive Action:		200.0	4.0
Testing		950.0	19.0
Counseling		950.0	19.0
Meetings			
C: Acceptance:			
Sign agreement	20 min		0.4
Pass screening		30 min	0.6
Meeting attendance		30 min	0.6

44.6 Contact Hours = 2.97 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate ability to maintain requirements of employers and training procedures in relationship to use of alcohol and drugs in order to finish training and become employed and maintain employment status.

OBJECTIVE # 31. Alcohol & Drug Abuse

Performance	Condition	Criterion
Sign form agreeing to random testing. **RESULTS CONFIDENTIAL.**	Form will accompany application.	Form will become part of permanent apprentice record.
Submit to urinalysis & breath-alizer test.	Tests will be administered by outside contractor.	Tests will be analyzed by reputable lab; ie:SmithKline Labs.
Apprentices who check positive attend on and/or off site meetings as advised by counselor & fill out attendance sheets.	AA/NA meetings, seminars & individual counseling will be conducted on and/or off site as counselor/s so designate. Attendance sheets will be made available.	Attendance sheets will be reviewed weekly along with progress results. Must be clean in last quarter to achieve 100%

MSTP

UNIT	CLASSROOM	LAB WORK	TOTAL HOURS
32. Industry Apprentice Pre-Enrollment Screening.			
A. Familiarization of Screening Process:			
Contacting industry volunteer	20 min		0.4
Setting appointment	15 min		0.3
Travel arrangements	10 min		0.2
Interviewing	30 min		0.6
Reporting results	10 min		0.2
B: Implementing Process:			
Contact volunteer		50 min	1.0
Set appointment		15 min	0.3
Arrange transportation		25 min	0.5.
Attend interview		50 min	1.0
Report results		30 min	0.6
C: Acceptance:			
Fill out check list	20 min		0.4

5.5 Contact Hours = 0.37 CREDIT HOURS

Complete the following objective tasks by using detailed listings ?-1 through ?-?, use check list/s ?-1 through ?-?.

Purpose of objective: Demonstrate knowledge of employers requirements while enrolling in course and fulfilling employers expectations by course ending.

OBJECTIVE # 32. Industry Apprentice Pre-Enrollment Screening

Performance	Condition	Criterion
Contact assigned volunteer pre-enrollment employer & set up screening appointment.	Work sheet with name, address & phone # of employer.	Agreeable date & time of employer & apprentice.
Make travel arrangements & attend interview.	Car or bus & decent attire.	Prompt attendance.
Report interview results to lead instructor.	Contact lead instructor.	Favorable recommendation.

6 - Learning Objectives for Tasks #33 A through 35 F

This section needs to be written in its entirety; however the anticipated training and instruction hours needed for an apprentice to learn these objectives has been allocated.

The learning objectives for tasks numbered 33 A through 35 F need to be written;

Each learning objective requires a lesson plan;

A learning resource module; and

A product/performance checklist.

7 - Contact and Credit Hours

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BREAK-DOWN OF CONTACT & CREDIT HOURS

Basic Course Objectives # 1. Through 32.

UNIT Objective #	CONTACT HOURS:	CREDIT HOURS:
# 1.	4.50	0.30
# 2.	2.00	0.13
# 3.	1.50	0.10
# 4.	8.50	0.57
	Sub-Total 16.5	**Sub-Total 1.1**
# 5.	52.60	3.51
# 6.	26.40	1.76
# 7.	46.00	3.08
# 8.	4.70	0.31
	Sub-Total 129.70	**Sub-Total 8.66**
# 9.	2.50	0.17
# 10.	41.00	2.70
	Sub-Total 43.5	**Sub-Total 2.87**
# 11.	1.80	0.12
# 12.	2.20	0.15
# 13.	3.00	0.20
	Sub-Total 7.0	**Sub-Total 0.47**
# 14.	13.00	0.73
# 15.	23.00	1.53
# 16.	5.10	0.34
# 17.	10.20	0.68
# 18.	5.10	0.34
# 19.	2.80	0.19
# 20.	8.30	0.55
# 21.	5.00	0.33
# 22.	8.00	0.53
# 23.	7.00	0.46
# 24.	6.40	0.43
# 25.	7.60	0.51
# 26.	8.40	0.56
# 27.	5.30	0.35
# 28.	7.90	0.53
# 29.	60.20	4.01
# 30.	98.00	6.53
	Sub-Total 281.3	**Sub-Total 18.6**
# 31.	44.60	2.97
# 32.	5.50	0.37
	Sub-Total 50.1	**Sub-Total 3.34**
	COLUMN TOTALS 528.10	35.04

MSTP

Revised 5-21-91

BREAK-DOWN OF CONTACT & CREDIT HOURS

Advanced Course Objectives # 33. Through 35.

UNIT Objective # and Description		AVERAGE LAB HOURS	MINIMUM LAB HOURS	MAXIMUM LAB HOURS
# 33 A. Tool Crib Tending		72.00	35.00	110.00
# 33 B. Production Experience	C.C.C.	30.00	10.00	60.00
	B.S.O.C.	260.00	120.00	280.00
# 33 C. Lathe Work		20.00	10.00	40.00
# 33 D. Machine & Shop Maintenance		65.00	20.00	130.00
# 33 E. Scrap/Chips & Material Handling		40.00	20.00	75.00
# 34 A. Additional Machine Set-Ups		270.00	100.00	400.00
# 34 B. Attendance/Work Habits & Other Counseling NOT Related To D & A Abuse. Neither Lab or Lecture		24.00	12.00	34.00
# 34 C. General Work Area & Shop Clean-Up		40.00	30.00	100.00
# 34 D. Resumes Neither Lab or Lecture		14.40	10.00	18.00
# 34 E. In-Plant Shop Tours		28.80	12.00	43.20
# 35 A. Threading		75.00	35.00	150.00
# 35 B. Apprentice Evaluation of Program Neither Lab or Lecture		1.50	1.00	2.00
# 35 C. Statistical Process Control (SPC)		20.00	5.00	60.00
# 35 D. Additional Tool Grinding Assignments		41.20	10.00	80.00
# 35 E. General Safety Precautions		60.00	45.00	100.00
# 35 F. Additional Check Lists		20.00	10.00	30.00
Column Totals		**1081.90**	**485.00**	**1692.20**
Totals From Objectives # 1. through 32.		**528.10**	**00.00**	**00.00**
GRAND TOTAL		**1,610.00**	**COURSE OBJECTIVE CONTACT HOURS**	
TOTAL CREDIT HOURS		**106.00**		

Suggested Course Guidlines: Six and one half hours per day for two hundred and forty eight days equals 1,612 college credit contact hours. A shift starting at 8.00 AM and ending at 3 PM with a half hour lunch break over a one year course period will provide these hours.

8 - This Section Contains Supplementary Information

Additional MSTP Support Information

The Multiple Spindle Automatic Screw Machine Apprentice Trades Training Program
is ALWAYS in need of additional donations.

ITEMS NEEDED INCLUDE; EQUIPMENT, ATTACHMENTS, TOOLING, MATERIAL AND OTHER.
It is with heartfelt gratitude that the students and staff of MSTP thank you for your support.

Please know that all contributions are tax deductible as provided by law.

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COMPANY DONATIONS RECEIVED:

Equipment:	Attachments:	Tooling:	Material:	Other:
Bodine Electric Company. Panek Precision.	Bodine Electric Company. Stewart-Warner Corp.	Elk Grove Ind. Supplies. West Precision Tool. Scully Jones Corp. Rixon-Firemark Division Conrac Division. Stewart-Warner Corp.	Scully Jones Corp. Rixon-Firemark Division Conrac Division.	Stewart-Warner Corp.

COMMITMENTS:

Safety Socket Screw.

Safety Socket Screw.

MSTP DEVELOPMENT FUNDING AND/OR OTHER RESOURCES

Funding and Other Resources:

City of Chicago Economic Development Commission

State of Illinois Department of Commerce and Community Affairs

Chicago Commons Association Industrial & Business Training Programs

Other Resources:

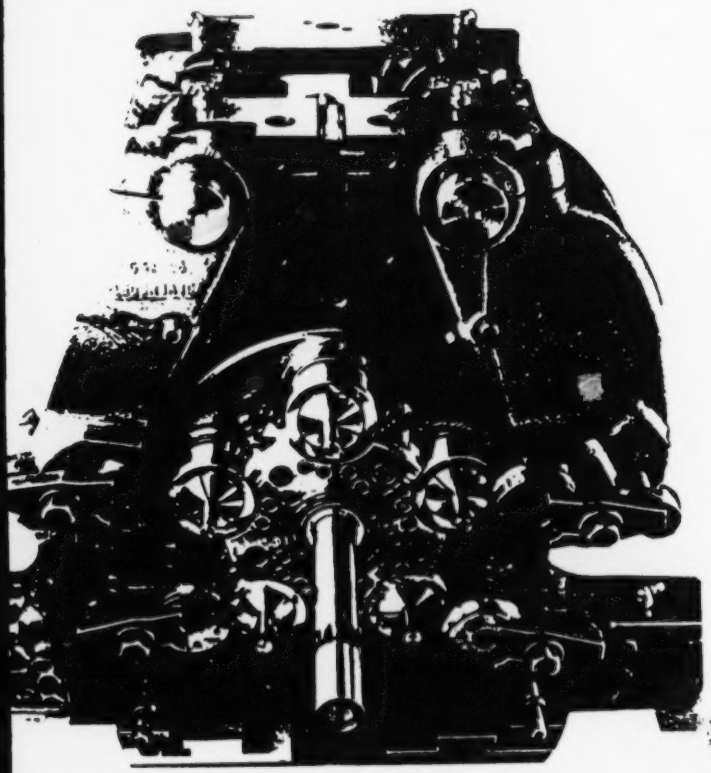
Productive Chicago Initiative, City Colleges of Chicago

City of Chicago Department of Economic Development

City of Chicago Mayors Office of Employment and Training

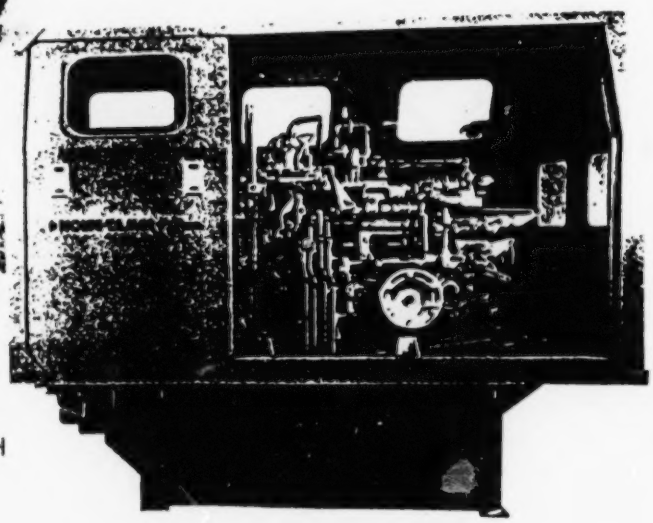
On-Going Funding Commitments: Productive Chicago Initiative, City Colleges of Chicago

The Davenport Model B Five Spindle Automatic Screw Machine



Capacities
Capacity: Round—⅞"; Square—19/32"; Hexagonal—¾"
Stock Feed—4½"
Longest Turning Length—3"
Number of Spindle Speeds—27
Range of Spindle Speeds—500-4500 rpm
Number of Feed Rates—60
Range of Feed Rates—.8-18.4 seconds
Index Time—.4 seconds (constant)

Size of Equipment
Diameter of circular tools—2"
Diameter of hole in tool spindle—¾"
Outside diameter of tool spindle—1⅜"
Least distance between chuck and tool spindle—2⅛"
Greatest distance between chuck and tool spindle—4 13/16"
Diameter of long feed cams—7½"
Diameter of cross feed cams—6"
Thickness of cams—⅜"



Dimensions and Weight
Size crate—machine—44"W x 98"L x 69"H
Size crate—wire case carrier—
11½"W x 11½"H x 124"L
Net weight—machine—3600 lbs
Net weight—wire case carrier—175 lbs
Gross weight—machine—(boxed)—3800 lbs
Gross weight—wire case carrier—225 lbs

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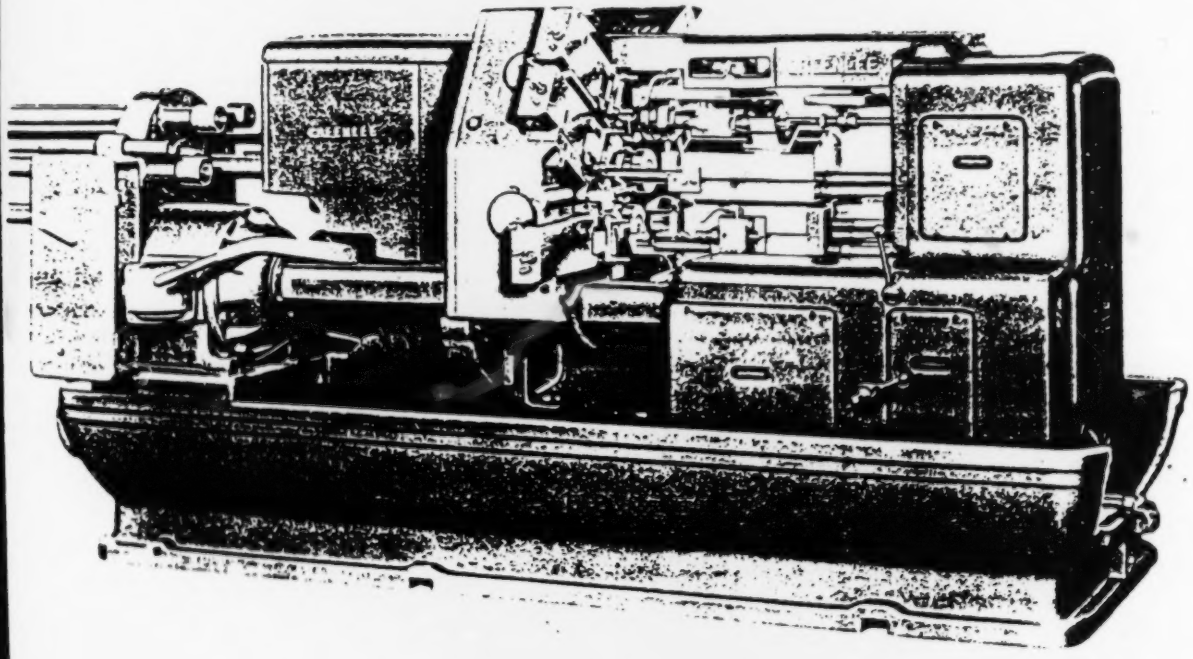
DAVENPORT MACHINE
DOVER INDUSTRIES COMPANY

D/D

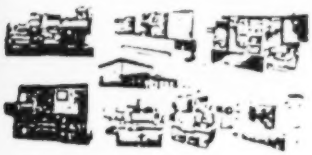
PLANT: 167 Ames Street, Rochester, NY 14611
MAIL: P.O. Box 228, Rochester, NY 14601
PHONE: 716-235-4545, TELEX 978303, FAX: 716-235-9034

SPECIFICATIONS — 1"-6, 1-5/8-6 & 2"-6 SPINDLE AUTOMATICS



SIZE OF MACHINE	1"-6	1-5/8"-6	2"-6
Chuck Capacity, Round	1"	1-5/8"	2"
Chuck Capacity, Hexagon	7/8"	1-13/32"	1-3/4"
Chuck Capacity, Square	3/4"	1-1/8"	1-7/16"
Stock Feed	6-3/16"	8-5/16"	8-5/16"
Turning Length	6"	7-1/2"	7-1/2"
Spindle Speed Range	225 to 2500	105 to 2175	95 to 1935
Feed Range per Spindle Rev.	.0014 to .0218	.0017 to .0388	.0019 to .043
Motor Horsepower	15	20	25
R. P. M.	1800	1800	1800
Floor Space:			
Length with Stock Reel	17' — 6"	17' — 3"	17' — 3"
Length without Stock Reel	10' — 5"	10' — 6"	10' — 6"
Width	5' — 0"	5' — 4"	5' — 4"
Height	4' — 11"	5' — 4"	5' — 4"
Net Weight in Pounds	14400	17940	18150
Domestic Shipping Weight	14850	18390	18500
Boxed for Export (Approx)	16800	20430	20600
Cubic Feet, Boxed	378	400	400

(708) 535-2209
Fax: (708) 535-0103
Graff-Pinkert & CO.
Machinery - Automatic Screw Machines
4235 West 166th Street
Oak Forest, Illinois 60452



Address Correction Requested

BEST COPY AVAILABLE

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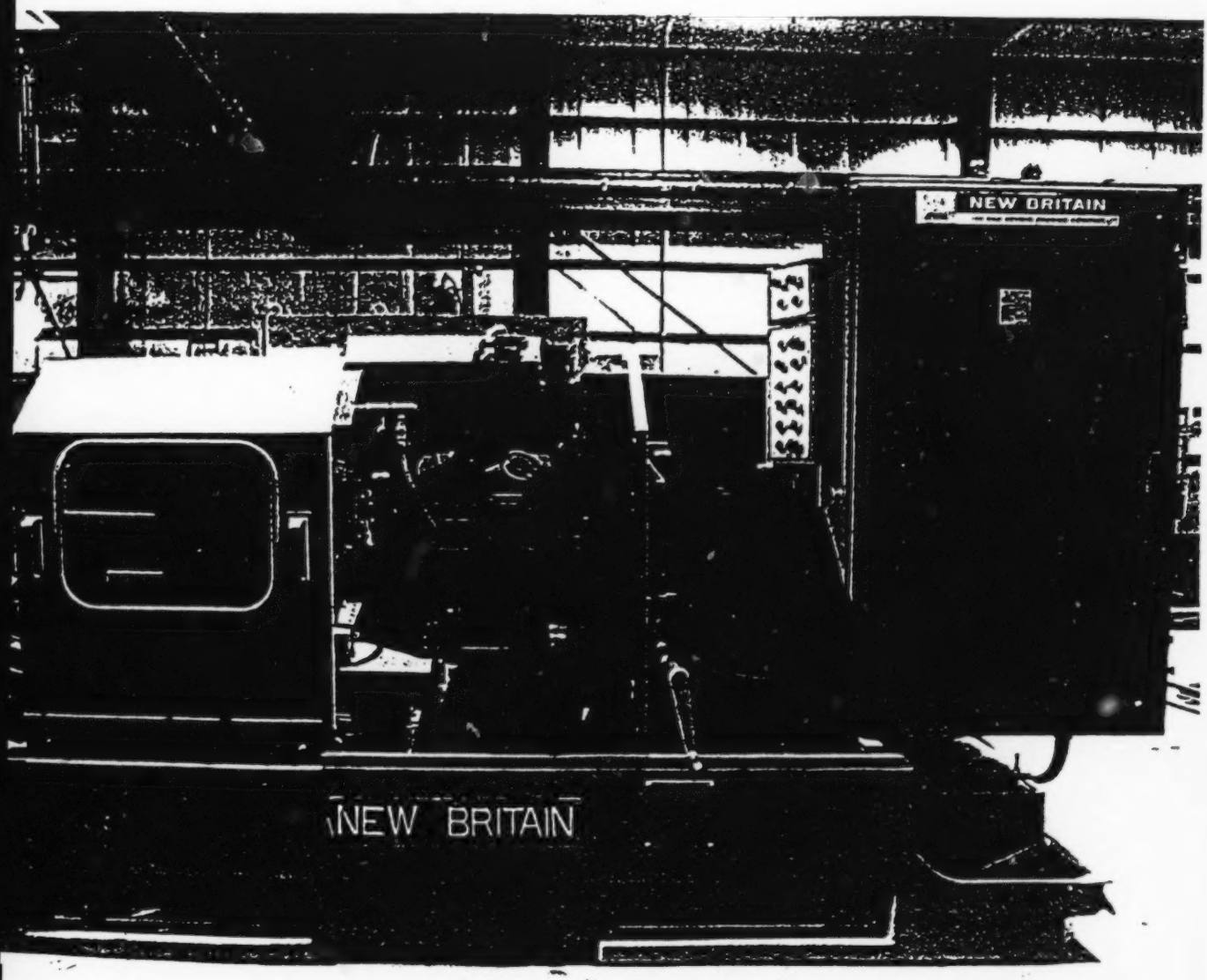
U.S. POSTAGE
PAID
Oak Forest, IL
Permit No. 22

Chicago Commons Screw Machines
Ric Gudell or Plant Mgr.
2448 W. Fletcher
Chicago IL 60618



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New Britains continue to be a staple of our business. We have recently purchased this Model 62, 2¼" 6 spindle built in 1981. We own three more Model 62's of similar vintage, which we are converting from collet chuckers to bar machines. Also currently in stock are two Model 816, 1⅝" 8 spindle New Britains built in 1974, a 1" Model 51 collet chucker 1976, two Model 635, 3½" 6 spindle 1976, a 640, 4" 6 spindle 1979, and a 657 chucker, 5⅞" 6 spindle 1980. These machines are priced attractively:

Wickman spare parts inventory

RECESSION TIME — WHAT, ME WORRY?

The heralded recession of 1990 has probably already arrived. Don't worry about it. We've lived through worse, we'll get through this one.

After having had good business for several straight years most of us are a bit soft and complacent. A few tough months will make us out of our overconfidence. This slowdown will be unpleasant but not unbearable.

Inventories are skimpy. The revolution in computerized inventory management in recent years means that the dislocations caused by inventory accumulations will be modest.

Inflation is controlled. Real inflation is now under 5%. A significant part of the inflation statistic is a surge in home prices which affects only the small number of folks looking for a house. Much of that inflation is in West Coast real estate which will be coming down to earth following the quake in Northern California. Industrial inflation, roaring 9 months ago, is virtually flat today. The Japanese are slashing prices on machine tools. Steel & aluminum are soft. Energy is stable.

With this climate American interest rates should fall. Look for 6½% on short term treasuries and 7% on long term bonds by March of 1990. A single digit prime rate is coming. The Federal Reserve is trying to stamp out inflationary expectations by keeping rates fairly high. It is also protecting the dollar so the Japanese will keep buying American debt. But if the recession starts to bite hard, Mr. Greenspan will respond to the political pressure for lower interest rates.

Much is made out of the fact that the U.S. is now a debtor nation. The important fact to remember is that the United States is a magnet for foreign investment because it has a stable political system, vast opportunity for growth, and a huge and productive economic foundation. While our budget deficit is significant, it is well within the norms of other industrial countries as a percentage of Gross National Product.

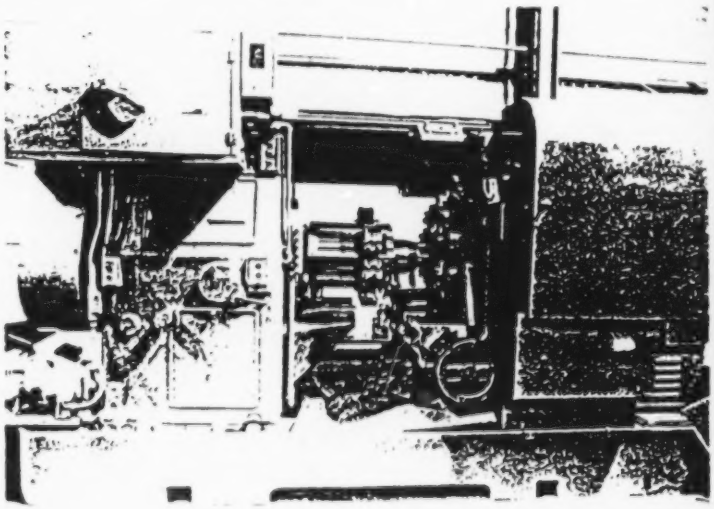
Focusing on the manufacturing part of the economy I see a slowdown in the American automotive industry which will affect the screw machine business.

Overall demand for cars and trucks is in a cyclical downturn after 4 strong years. Add the huge increase in Japanese production in the U.S. and you have big time oversupply. Unfortunately, the Japanese plants do not buy much from American vendors. Most of the "American content" in their cars is direct labor. This does not bode well for American automotive subcontractors. But the aftermarket should continue to be strong.

The farm economy is much improved and farmers are starting to buy machinery again. Off the road equipment should do well as lower interest rates keep real estate development perking. Commercial aircraft is in a monumental boom which will counteract the current military downturn. Electronic hardware will be volatile as the dollar fluctuates, but a lower dollar is likely if interest rates go down.

It looks to me like the economy has just run out of steam for the time being. Stock market turmoil stemming from rampant speculation, computer trading programs, junk bond gluttony, and the herd mentality of institutional investors has small investors jumpy. This erodes business and consumer confidence. A vacillating administration with no clear mandate to get anything important done also hurts confidence.

But do not over react to the slowdown. It will pass. It will also create its own opportunities as marginal companies fall aside and bargains present themselves. We can all look back at downturns and see that they were windows of opportunity. The modest recession of 1990 will be no exception.



NATIONAL ACME'S

7/16" RA6, pickoff, 5 slides, 1972 (2)

1" RA6, dbl. thread, spindle stop, 1952. Government

2" RB8 dble feedout, 1966 (2)

2½" RB6, 1952, threading, GOVERNMENT SURPLUS (2)

3½" RB6, 1953 Government

8" RPA8, thdg, chucks, 1954. Government

If it says "one size fits all," it doesn't fit anyone.

The more useful the shopping list the more likely it will be left at home.

A crisis is when you can't say "Let's forget the whole thing."

BEST COPY AVAILABLE

PRODUCTIVE CHICAGO INITIATIVE
RICHARD J. DALEY COLLEGE
City Colleges of Chicago

CHICAGO COMMONS ASSOCIATION
INDUSTRIAL AND BUSINESS
Training Programs Division

COURSE SYLLABUS

INSTRUCTOR _____

Check _____ Weeks

_____ Weeks

DEPARTMENT _____

_____ Other

SEMESTER _____

COURSE TITLE: _____

COURSE NUMBER: _____ COURSE SECTION: _____

CONTACT HOURS: _____ CREDIT HOURS: _____

Course is needed for general education requirements _____, majors in an elective _____.

COURSE DESCRIPTION: (Exactly as it appears in the current CCC Catalog. (Include a specific course, placement test score of skill level; if no prerequisites are required, leave blank.)

INSTRUCTIONAL METHODS: (Check those that apply.)

_____ Lecture _____ Laboratory

_____ Discussion _____ Other (Specify) _____

COURSE OBJECTIVES IN MEASURABLE TERMS (Use additional pages if needed) Course objectives should be uniform for all sections of a multi-section course, each instructor may accomplish them differently.

STATE OF ILLINOIS
OCCUPATIONAL EMPLOYMENT (1986 AND PROJECTED 2000) AND AVERAGE ANNUAL JOB OPENINGS

OES CODE	OCCUPATIONAL TITLE	1986 EMPLOYMENT		2000 EMPLOYMENT		EMPLOYMENT CHANGE 1986 - 2000		AVERAGE ANNUAL JOB OPENINGS 1986 - 2000			
		NUMBER	%	NUMBER	%	NUMBER	%	TOTAL	%	GROWTH	SEPAR.
83000	INSPECTORS & REL. OCCUPATIONS	30,410	0.57	32,496	0.53	2,087	6.86	1,414	0.49	143	1,265
83002	INSPECTORS/TESTERS/GRAD., NON	9,099	0.17	9,550	0.15	451	4.96	368	0.13	32	336
83005	PROD. INSPECTORS, TEST., ETC.	19,508	0.37	21,142	0.34	1,634	8.38	964	0.34	117	848
83008	TRANSPORTATION INSPECTORS	2	0.00	2	0.00	-1	-25.49	0	0.00	0	0
83099	AO INSP., TEST., & REL. OCC	1,801	0.03	1,803	0.03	2	0.12	82	0.03	0	82
89900	OTHER PRECISION WORKERS	13,112	0.25	15,516	0.25	2,404	18.34	762	0.27	172	590
89921	DENTAL LAB TECHNICIANS, PREC.	2,199	0.04	2,705	0.04	506	23.02	128	0.04	36	92
89911	DET. DES. DECORATORS & PAINTE	920	0.02	1,025	0.02	105	11.38	36	0.01	7	28
89902	FOUNDRY MOLD & CORE MAKERS	740	0.01	720	0.01	-20	-2.66	33	0.01	-1	35
89905	MOLDERS & SHAPERS, EX. JEWELR	703	0.01	790	0.01	87	12.37	42	0.01	6	35
89908	PATTERNMAKERS, MODEL MAK., ET	80	0.00	89	0.00	10	12.21	5	0.00	1	4
89914	PHOTOG. PROC. WKRS., PRECISIO	1,078	0.02	1,474	0.02	396	36.68	65	0.02	28	37
89999	MISCELLANEOUS PRECISION WORKE	6,040	0.11	7,049	0.11	1,009	16.70	375	0.13	72	303
89923	MEDICAL APPLIANCE MAKERS	908	0.02	1,102	0.02	193	21.26	51	0.02	14	38
89917	OPTICAL GOODS WORKERS, PREC.	443	0.01	562	0.01	119	26.86	27	0.01	9	18
91000	MACH. SET., SET-UP OP., OP., & TE	229,787	4.34	252,507	4.09	22,720	9.89	9,928	3.46	1,623	8,305
91502	NUM. CONT. MACH. TOOL OP. & TEN	4,440	0.08	5,237	0.08	796	17.93	126	0.04	57	69
91510	COMB. MACH. TOOL SET., SET-UP O	5,616	0.11	6,053	0.10	437	7.78	203	0.07	31	172
91508	COMB. MACH. TOOL OP. & TEND.	3,278	0.06	3,555	0.06	276	8.43	120	0.04	20	100
91505	COMB. MACH. TOOL SET. & SET-U	2,338	0.04	2,498	0.04	160	6.86	83	0.03	11	71
91200	MACH. TOOL CUT.& FORM. SET. & O	52,905	1.00	55,558	0.90	2,653	5.01	1,903	0.66	189	1,713
91108	DRILL. MACH. TOOL SET. & SET-	3,841	0.07	3,914	0.06	72	1.89	126	0.04	5	121
91311	EXT. & DRAW. MA. SET. & SET-U	2,979	0.06	3,250	0.05	271	9.09	102	0.04	19	82
91317	FORGING MACH. SET. & SET-UP O	806	0.02	741	0.01	-65	-8.07	19	0.01	-5	23
91114	GRINDING MACH. SET. & SET-UP	3,665	0.07	3,771	0.06	106	2.89	129	0.04	8	121
91105	LATHE MACH. TOOL SET. & SET-U	5,251	0.10	5,473	0.09	222	4.23	175	0.06	16	159
91321	MACHINE FORMING OP. & TEND.	13,930	0.26	14,948	0.24	1,018	7.31	509	0.18	73	436
91117	MACH. TOOL CUT. OP. & TEND.	7,776	0.15	8,186	0.13	410	5.27	298	0.10	29	269
91111	MILLING MACH. SET. & SET-UP O	1,898	0.04	2,017	0.03	119	6.27	68	0.02	8	59
91305	PRESS MACH. SET. & SET-UP OP.	2,643	0.05	2,725	0.04	82	3.09	93	0.03	6	87
91302	PUNCH MACH. SET. & SET-UP OP	6,415	0.12	6,796	0.11	381	5.95	241	0.08	27	214
91314	ROLLING MACH. SET. & SET-UP O	1,677	0.03	1,630	0.03	-47	-2.79	74	0.03	-3	77
91102	SAWING MACH. TOOL SET. & SET-	679	0.01	726	0.01	47	6.91	24	0.01	3	21
91308	SHEAR MACH. SET. & SET-UP OP.	1,343	0.03	1,380	0.02	37	2.79	47	0.02	3	44
91700	MET. FAB. MACH. SET., & OPER.	7,565	0.14	8,261	0.13	696	9.20	264	0.09	50	215
91714	METAL FABRICATORS, STRUC. MET	1,854	0.03	2,129	0.03	276	14.87	93	0.03	20	73
91711	SOLDER & BRAZ. MACH. OPERATO	165	0.00	184	0.00	18	11.17	7	0.00	1	6
91708	SOLDER & BRAZ. MACH. SETTERS	274	0.01	298	0.00	24	8.86	11	0.00	2	9
91705	WELDING MACHINE OPER. & TEND.	2,150	0.04	2,394	0.04	244	11.37	70	0.02	17	53
91702	WELDING MACHINE SET. & SET-UP	3,122	0.06	3,255	0.05	133	4.26	83	0.03	10	74
91900	MET. & PL. PROC. MACH. SET. & O	18,457	0.35	20,329	0.33	1,871	10.14	686	0.24	134	553
91921	ELEC. PLAT. MACH. OPER. & TEN	1,418	0.03	1,643	0.03	226	15.92	60	0.02	16	44
91917	ELEC. PLAT. MACH. SET. & SET-	991	0.02	1,180	0.02	189	19.11	45	0.02	14	31
91914	FOUNDRY MOLD ASSEM. & SHAKEOU	263	0.00	249	0.00	-14	-5.41	6	0.00	-1	7
91935	FURNACE OPERATORS & TENDERS	1,296	0.02	1,232	0.02	-65	-4.99	38	0.01	-5	43
91938	HEATERS, METAL & PLASTIC	318	0.01	304	0.00	-14	-4.25	10	0.00	-1	11
91928	HEAT. EQUIP. SET. & SET-UP OP	667	0.01	763	0.01	96	14.45	31	0.01	7	24
91932	HEAT TREATING MACH. OP. & TEN	1,934	0.04	2,164	0.04	230	11.90	86	0.03	16	70

SOURCE: ECONOMIC INFORMATION AND ANALYSIS DIVISION, ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY (IDES)

SUPPLY-DEMAND REPORT
STATEWIDE

CLUSTER 1343 MACHINE TOOL OPERATIONS

ANNUAL SUPPLY OF PROGRAM COMPLETERS

PROGRAM	CIP CODE	CIS CODE	ALLOC %	PUBLIC SECOND	+ PUBLIC ADULT	+ POSTSECONDARY: CAREER SCHOOLS	+ CERTIFICATE	+ ASSOCIATE	+ BACHELOR	+ GRADUATE & PROF	+ JOB CORPS	+ JTPA	+ MILITARY	= SUPP TOTAL
PRECISION METAL WORK	48.0501	295	25	101	0	0	0	9	0	0	0			
MACHINE TOOL OP/MACH SHOP	48.0503	295	100	1,023	0	22	74	64	0	0	0			1,1
SUPPLY TOTAL				1,204	0	22	74	73	0	0	0			1,3

OCCUPATIONAL DEMAND

OCCUPATION	OES CODE	CIS CODE	ALLOC %	ESTIMATED EMPLOYMENT 1986	PROJECTED EMPLOYMENT 1995	EMPLOYMENT CHANGE 1986-95	AVERAGE ANNUAL GROWTH	+	AVERAGE ANNUAL SEPARATIONS	=	AVERAGE ANNUAL OPENINGS
INSTRUMENT MAKERS, PRECISION	89105636		100	267	303	36	4		10		14
MACHINISTS	89108639	5464	100	19,831	21,162	1,331	148		758		905
TOOL GRINDERS, FILERS, ETC.	89111645	5466	100	1,837	1,850	13	2		90		92
LAYOUT WORKERS, METAL	89117638	5464	100	1,013	1,055	42	4		56		60
AO PRECISION METAL WORKERS	89199644		25	114	114	0	0		9		9
SAWING MACH. TOOL SET. & SET-U	91102702	5423	100	1,118	1,112	-6	0		33		32
LATHE MACH. TOOL SET. & SET-UP	91105695	5423	100	6,962	6,684	-278	-31		204		173
DRILL. MACH. TOOL SET. & SET-U	91108691	5423	100	4,911	4,645	-266	-29		150		121
MILLING MACH. SET. & SET-UP OP	91111698	5924	100	2,476	2,463	-13	-1		75		73
GRINDING MACH. SET. & SET-UP	91114694	5466	100	6,406	6,315	-91	-10		208		198
MACH. TOOL CUT. OP. & TEND.	91117697	5472	100	10,651	10,633	-18	-2		359		357
EXT. & DRAW. MA. SET. & SET-UP	91311692		100	1,857	1,903	46	5		49		54
ROLLING MACH. SET. & SET-UP OP	91314701	5423	100	1,711	1,760	49	5		81		86
FORGING MACH. SET. & SET-UP OP	91317693	5423	100	883	961	78	8		27		36
MACHINE FORMING OP. & TEND.	91321696	5474	100	17,432	17,978	546	60		531		592
NUM. CONT. MACH. TOOL OP. & TE	91502686	5472	100	4,930	5,682	752	84		73		157
COMB. MACH. TOOL SET. & SET-UP	91505689	5423	100	3,233	3,267	34	4		95		99
COMB. MACH. TOOL OP. & TEND.	91508688	5472	100	3,297	3,382	85	10		98		107
PLAS. MOLD. MACH. SET. & SET-U	91902723	5424	100	2,618	3,011	393	44		72		116
HEAT. EQUIP. SET. & SET-UP OP.	91928716	5426	100	653	640	-13	-1		22		21
HEAT TREATING MACH. OP. & TEND	91932717	5426	100	1,510	1,519	9	1		51		52
DEMAND TOTAL				93,710	96,439	2,729	305		3,051		3,354

4. Screw Machines

a. Data Source: Occupational Projections, 1986-2000, published by the Occupational Employment Statistics Section, Economic Information and Analysis Division, Program and Planning Bureau, Illinois Department of Employment Security, August, 1990, page 54.

OES Code	Occupational Title	Average Annual Job Openings
91000	Mach. Set., Set-Up Op., Op.,	9,928
91105	Lathe Mach. Tool Set & Set-U	175
91117	Mach. Tool Cut. Op. & Tend.	298

b. Data Source: Occupational Projections, 1986-2000, published by the Occupational Employment Statistics Section, Economic Information and Analysis Division, Program and Planning Bureau, Illinois Department of Employment Security, August, 1990, page 16.

For the screw machine products manufacturing sector, the data are the following:

SIC CODE	INDUSTRY NAME	PROJECTED 2000 EMPLOYMENT	EMPLOYMENT CHANGE NUMBER & PERCENT
345	Screw Machine Prod.	16,796	2,928/+20.84

APPENDIX E

Victor Guarino II Sr.
1004 N. Oak Park Ave.
Oak Park, Illinois 60302
(708) 848-7175

Education:

Master of Science in Mechanical Engineering
Illinois Institute of Technology, Dec. 1988
GPA 3.7/4.0

Bachelor of Science in Mechanical Engineering, Illinois Institute of Technology, May 1987 GPA 3.5/4.0

Employment:

October, 1990 - Present
Argonne National Laboratory, 9700 S. Cass Ave., Argonne Il.
Project Engineer designing tooling fixtures, test stands and structural members for the Super Collider Calorimeter. Responsible for developing a method of high volume production of scintillater tiles for Super Collider Calorimeter.

December, 1988 - October, 1990
American National Can, 8770 W. Bryn Mawr Ave., Chicago, Illinois 60631
Project Engineer in charge of setting up CAM system at in-house machine shop. Tooling Engineer responsible for the design of new tooling for new can profile designs and tooling maintenance.

May, 1987 - December, 1988
IIT Manufacturing Laboratory
Connected Dynamometers to lathes and designed and constructed power and signal amplifiers

May 1988 - August 1988
A. Finkl & Sons, 2011 Southport Ave.
Chicago,Illinois
Draftsman

Areas of Proficiency:

1. Programming
   a. Fortran
   b. Computer Numerically Controllled Machine Code
2. CAD/CAM (Autocad, Anvil, Computervision)

Honors:

Awarded an IIT Fellowship in 1987

Activities:

President of the IIT chapter of the American Society of Mechanical Engineers August 1986 - May 1987
Member of the Society of Manufacturing Engineers and the Society of Mechanical Engineers
Volunteer Education Coordinator at Neon Street, a teen shelter affiliated the Travelers and Immigrants Aid

PREM S. SUD
705 Kelley Drive
Rochelle, IL 61068
(815) 562-8178

OBJECTIVE Seeking a challenging position to utilize my qualifications and professional experience.

QUALIFICATIONS

- Master of Science Degree in Industrial Engineering.
- Experience gained through 20 years of management in engineering, industrial and manufacturing engineering.
- Development and implementation of business modernization, automation, productivity improvement and strategic planning.
- Knowledge and experience in management and employee training programs.
- Working knowledge of MRP, JIT, Group Technology, Set-up Reduction and SPC.
- Teach Industrial Engineering courses at Northern Illinois University - Adjunct Professor.
- Independent consulting in project management, industrial and manufacturing engineering.
- Knowledge of personal computers; proficiency in Lotus, D-Base, CNC programming, Auto CAD and DW4, etc.

PROFESSIONAL EXPERIENCE

2/90 TO PRESENT — ROCK VALLEY COLLEGE - TECHNOLOGY CENTER, Rockford, IL
The Technology Center is involved in development and application of advanced contemporary manufacturing technologies.

Manufacturing Resource Engineer
Responsible to the Director of Technology Center for transfer of education, training and advanced technology to local industry to strengthen the industrial base of this area. Responsibilities include:

- Development of Manufacturing Modernization Model to improve competitive position of local companies.
- Interface with company CEO's and management to carry out assessment of their overall business to determine short and long-term opportunities to improve productivity.
- Matching and providing resources, such as training, management, technical and consulting assistance to implement potential strategies.

1989-1990 — SUPERIOR TOYS, Rockford, IL
A multi-plant producer of metal and plastic toys and other consumer products.

Manager of Engineering and Quality Control
Responsible to the Vice President of Corporate Operations for all facets of Engineering services. Responsibilities included:

- Control and maintenance of 370,000 square foot facility.
- Coordination and timely execution of relocation of equipment from acquired facilities to a consolidated location.
- Development and execution of modernization and operations improvement programs for two different locations.
- Set-up of quality control testing and control procedures.

1977-1989 — CARON INTERNATIONAL, Rochelle, IL
A multi-plant producer of consumer yarns with $90MM sales & 1,600 employees.

Manager of Industrial Engineering
Responsible to the Vice President of Manufacturing for the corporation's industrial and project engineering functions. Activities included strategic planning, manufacturing automation, productivity improvement, incentives application, work simplification, valve analysis, standard cost and budgeting, JIT concepts, including set-up reductions, scheduling and execution of design and operational improvement projects. Staff consisted of 5 engineers over three locations.

Manager of Industrial Engineering (Cont.)

- Accomplished cost reductions in excess of $1.5MM for 12 consecutive years.
- Building and set-up of a 126,000 square foot distribution facility with savings in excess of $300,000 per year.
- Equipment modification resulting in savings of $690,000 for the year.
- Methods improvement program resulted in doubling of productivity per person hour.
- Implemented corporate energy conservation program resulting in a cost savings of $250,000 per year.

1966-1977 BEAUNIT CORPORATION (CORPORATE STAFF), Raleigh, NC

A multi-plant producer of polymers, polyester, fibers, and textiles. Annual sales of over $300MM and 7,500 employees.

Corporate Principal Engineer (1973-1977)

Responsible to Director of Engineering for the programming, planning, and execution of numerous manufacturing, automation, administrative, materials handling, planning and cost reduction of corporate projects of major scope, importance and value. Responsibilities also included providing consulting assistance to plant engineering, manufacturing, and accounting staffs.

- Relocation of corporate labs and administrative offices saving $1,050,000 per year.
- Planning and scheduling of two plant expansions; saving $650,000 per year.
- Product packaging, handling, warehouse, and distribution. A major study resulting in savings of $250,000 per year.
- Process flow modification with cost reduction of $400,000 per year.
- Development of company-wide standards development systems.
- Application of short interval scheduling.

Manager Industrial Engineering (1971-1973)

Responsible for all Industrial Engineering services in 8 manufacturing facilities.

Engineering Superintendent (1969-1971)

Responsible to the Plant Manager. Directed and supervised all Project and Industrial Engineering services for 700 employees.

Division Industrial Engineering and Project Cost Accounting (1966-1969)

Responsibilities included work on special projects and also to provide assistance to the Industrial Engineering staff at 6 locations.

1964-1966 DU PONT COMPANY, Old Hickory, TN

A Fortune 500 company with 100,000 employees world-wide; 3,000 at the Old Hickory facility.

Area Engineer (Operations Research and Plant Layout Group)

1960-1963 BIRLA CORPORATION, New Delhi, India

Production Supervisor and Manufacturing Engineer

EDUCATION

North Carolina State University
MS in Industrial Engineering
Punjab University, India
BS in Engineering

PERSONAL DATA

Married, two children
Excellent health
U.S. Citizen

AFFILIATIONS

Institute of Industrial Engineers - Member
Rochelle, IL Utility Advisory Board - Member
Rotary Club - Member (Past President)

APPENDIX F

Metalworking Program
Marketing Plan

Strategies

- Increase awareness and understanding of the features and benefits of the Productive Chicago metalworking initiative among industry executives.
- Position metalworking as an appealing and financially rewarding career option among high school and non-traditional students.
- Involve industry in an on-going basis in student recruitment, as well as curriculum and competency development.
- "Guarantee" results for both employers and students.

Tactics

- Develop a marketing kit and (Adapt the Tooling and Manufacturing Association's) video to tell the Productive Chicago metalworking story to business and industry, and to students, teachers, counselors and parents.
- Segment and target metalworking businesses and end-user customers to solicit jobs, internship and financial support through mailing, personal and telephone contact, and "calling team" visits.
- Build an on-going media relations program around high-profile events and activities relating to the creation of the metalworking program, and identify spokesperson(s) from Productive Chicago program and industry supports to conduct media interviews and tours.
- Hold an open house at the Daley College lab for the metalworking industry, and use it as a forum to solicit industry commitments.
- Organize an "adopt-a-shop" program for local metalworking companies to call on high school shop classes and conduct plant tours for students. If possible, provide part-time or summer employment for shop teachers.
- Invite vocational-technical school shop teachers and counselors to a dinner and presentation on the Productive Chicago metalworking program.
- Designate a high school visiting team of industry and Productive Chicago representatives to "sell" the program to students through career day and other special events.
- Create a Productive Chicago metalworking scholarship program or promising students in Chicago vocational high schools.
- Develop and publicize a "contract of expectations" for participating students and employers "guaranteeing" value for their efforts and offering to provide remedial classes for free if a trainee does not measure up.

BOARD OF TRUSTEES COMMUNITY COLLEGE DISTRICT NO. 508
COUNTY OF COOK AND STATE OF ILLINOIS

CONSULTANT SERVICES
PRODUCTIVE CHICAGO METALWORKING PROGRAM MARKETING
CITY COLLEGES OF CHICAGO

TO THE BOARD OF TRUSTEES:

THE CHANCELLOR

REPORTS that the Board of Trustees has authorized development of the Productive Chicago metalworking program and that the opportunities and requirements of technical careers in metalworking be communicated to students, parents, teachers, counselors, and potential employers; and

that Productive Chicago requires consulting assistance in developing marketing materials and strategies for the metalworking program and that grant funds have been set aside for this purpose under the FY 1991 Tech Prep Planning Grant to Productive Chicago for metalworking; and

that Ogilvy & Mather Public Relations will provide consulting services to Productive Chicago to develop marketing materials and develop a detailed marketing plan in coordination with the City Colleges of Chicago, the Economic Development Commission, and the Chicago Public Schools; and

that this specific activity falls within the scope of extraordinary services that were anticipated during contract negotiations, and is, therefore, considered an added service.

THE CHANCELLOR

RECOMMENDS that the Board of Trustees authorize issuance of a purchase order for $9,940 from the Tech Prep Planning Grant to Ogilvy & Mather Public Relations for consulting services to the City Colleges of Chicago and expenses during the period June 6, 1991 to June 30, 1991.

Financial Charge to: 5-15-158-51-35

Approved:

Laurence B. Stanton
Vice Chancellor

Robert C. Rogers
Executive Vice Chancellor

Respectfully submitted

Nelvia M. Brady
Chancellor

June 6, 1991

APPENDIX G

SAMPLE - FOR DISCUSSION PURPOSES ONLY

Guidelines for MSTP Internship Sponsors

The sponsor will:

1. Interview and select apprentices from a pretested group;

2. Enter into a contractual agreement with the apprentice/s and Daley College.

3. Provide the apprentice/s with the remaining training experience needed to complete the apprenticeship.

4. Evaluate apprentice performance and issue certificates to apprentices who successfully complete the apprenticeship.

Chicago Commons Association & Daley College will:

1. Advertise for, screen, and test individuals to provide qualified candidates;

2. Assist the sponsor in apprentice/s selections;

3. Provide a 1350 hour on campus MSTP apprentice trades training program;

4. Provide staff and facilities for the MSTP program.

DRAFT - FOR DISCUSSION PURPOSES ONLY

The suggested duration of the internship is 40 days; with 8 days spent at the Training Center and 32 days spent at the sponsors site. The proposed hours are 6 1/2 hours per day, or a total of 52 hours at the Training Center and 208 hours at the sponsors site. We suggest Mondays through Thursdays at the sponsors site and Fridays spent at the Training Center for re-orientation purposes.

We propose that each site initiate an internship which suits their respective site.

The following jobs are performed in captive shops; with several performed in all shops.

Please indicate your interests on the columns below:

I think pursuing an internship is a worth while project? CHECK ONE: YES___ NO___ MAYBE___

If the suggested 32 days internship (days on sponsors site) is the agreed upon duration, I suggest the apprentices time be utilized as marked:

DESIGNATED APPRENTICE WORK AREA: SUGGESTED NUMBER OF DAYS IN AREA; 1 TO 32

1. Set/up a multiple spindle automatic screw machine: _____
2. Operate a multiple spindle automatic screw machine: _____
3. Work in an estimating department: _____
4. Work in a layout department: _____
5. Work with tool design: _____
6. Work in a tool crib and/or tool inspection: _____
7. Work with sales: _____
8. Work with management: _____
9. Work with material handling and storage: _____
10. Work in tool grinding department: _____
11. Work in chip/oil separating department: _____
12. Work in shipping and/or receiving department: _____
13. Work in inspection department: _____
14. Work on secondary operations: _____
15. Work in heat treating and/or carburizing department: _____

SAMPLE - FOR DISCUSSION PURPOSES ONLY

MSTP Internship - Employer/Training Center Agreement

1. If the apprentice selected from the candidates offered by the Training Center, and was terminated by the Training Center, ??????

2. If the employer chooses to terminate the apprentice prior to completing the Training Center period, ??????

3. If the Training Center is training an apprentice supplied by an employer, and termination is recommended, ???????

4. If an apprentice terminates his employment with the sponsor and obtains a job with another sponsor, the new employer shall, ???????

5. The Training Center will be a clearing house for apprentices and employers according to the contract.

6. If an apprentice having a certificate or diploma from the Training Center applies for employment while still under contract, the prospective employer must call the Training Center to determine the status of that apprentice. It is STRONGLY RECOMMENDED that no employer hire a person who is under contract to another sponsor company.

7. To reduce the employer's liability for an apprentice injury while in the Training Center, it is advised that the apprentice be carried on the employer's Workmen's Compensation insurance and should be reported as an employee at minimum wage for 20 ???? hours per week.
If an employer wishes to hire a candidate which has been screened prior to entering and completing training, a fee in the amount of ?????? for screening and assessment will be in order.

8. When the Training Center qualifies a candidate for an employer, one of the following options must be applied:

A. Hire the candidate and enroll him in the Training Center;

B: Send the candidate back to the Training Center for assignment to another sponsor. No side arrangement may be made with a candidate which circumvents the Training Center.

9. Employers desiring to sponsor apprentices in the Training Center must agree to these guidelines.

SAMPLE - FOR DISCUSSION PURPOSES ONLY

MSTP Internship - Apprentice/Sponsor Contract

This contract is made between the apprentice and the sponsor for the following purposes:

1. To provide quality training to the apprentice in the theory and practice of _____, with no initial investment being required from the apprentice;

2. To ensure the apprentice of job placement upon completion of the prescribed requirements as determined by the MSTP Training Center and the MSTP Industry Performance Evaluation Committee;

3. To assure the employer of adequate training for the apprentice; and

4. To provide the employer with a means of acquiring skilled labor as the market dictates.

A. LENGTH OF TRAINING

The apprentice agrees to attend all classes, perform all the required assignments and obey the rules of conduct and the regulations of the Training Center for a period of ____ consecutive months, commencing on _____ and ending on _____.

Upon successful completion of the Training Center program, the apprentice shall be given credit of ____ months or _____ hours depending on the MSTP Training Center and the MSTP Industry Performance Evaluation Committee's method of measuring the apprenticeship.

B. TRAINING COSTS

The sponser agrees to pay insurance training costs of $_____ incurred by the Sponser and any other costs that may arise while the apprentice works in the employer's facility during the internship.

C. REPAYMENT BY EMPLOYMENT

D. TERMINATION BY THE TRAINING CENTER

E. TERMINATION BY THE EMPLOYER

F. TERMINATION BY THE APPRENTICE

G. REPAYMENT BY AVAILABILITY

H. TRANSFER OF OBLIGATION

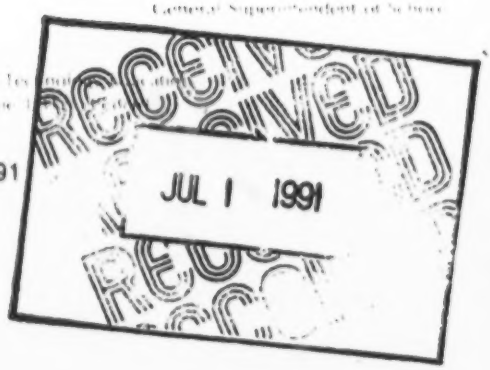
I. LAYOFF

APPENDIX H

CHICAGO PUBLIC SCHOOLS

Ted D. Kimbrough
General Superintendent of Schools

Department of Vocational Technical Education • Bureau of Industrial Technology
1819 West Pershing Road • Chicago, Illinois 60609 • Telephone



June 28, 1991

Dr. Shirley Knouzze
Daley College
7500 South Pulaski Road
Chicago, IL 60652

Dear Dr. Knouzze:

Enclosed are:

- Chicago Public Schools-Basic Machine Shop Curriculum
- Chicago Public Schools-Student Manual for Basic Machine Shop
- Chicago Public Schools-Intermediate Machine Shop Curriculum
- Chicago Public Schools-Machine Trades Student Skills Checklist

These instructional materials are being forwarded with the assurance that we are ready, willing and able to meet with you or a representative of the City Colleges to assist in the development of curriculum or to articulate what you already have developed in machine trades. We are also willing to revise and adapt our current guides to reflect any recommendations made by the I.Team to include employability and personal development skills. We are currently developing an advanced machine trades guide which should be completed by August 31, 1991. All of these publications were approved by representatives of the machine trades industry constituting the Chicago Public Schools Advisory Council.

Chicago Public Schools staff is available for the entire summer from July 1 to August 31, 1991. Please let me know when we can begin this process and your available dates in order to arrange for appropriate space.

Sincerely,

Harry Tobin, Director
Industrial Technology Education

HT:sd
Enclosure

cc: Len Modder
Bernard Spillman
Sharon Wheeler
Sandy Foster
Nelvia Brady
Milton Hill
Rick Gudell
Jack Sheahan
Paul Wolnik
Monica Ayring
Keith McKee

THE CHICAGO MANUFACTURING INSTITUTE/PRODUCTIVE CHICAGO

Chicago Commons Association's Industrial and Business Training Programs (CCA-IBTP) has been pursuing the development of a 'world class' manufacturing training activity that will prepare Chicago residents to meet the entry standards for skilled technical positions in firms oriented to global competition. This activity is named 'The Chicago Manufacturing Institute'.

The Productive Chicago Initiative of the City Colleges of Chicago (CCC) is interested in the development of a manufacturing career 'tech prep' program focused in metalworking that will afford Chicago public high school juniors an opportunity to develop, through an articulated four year high school/City College program, the knowledge, skills, habits, and attitudes necessary to qualify for employment in skilled technical positions in metalworking firms throughout the Chicago metropolitan area.

Because of substantial synonymity of interest on the part of these two organizations, it is prudent to jointly pursue the development of a metalworking component of the Chicago Manufacturing Institute. Because the City Colleges of Chicago Productive Chicago initiative has sought and received funds for the development of a manufacturing career 'tech prep' program and because Chicago Commons Association's Industrial and Business Training Programs has developed manufacturing (including metalworking) training programs in the past, it is prudent that the City Colleges of Chicago Productive Chicago obtain the assistance of CCA-IBTP in fulfilling CCC's objectives in the manufacturing career 'tech prep' program.

Therefore, it is resolved that CCA-IBTP will provide the following services toward the development of the jointly developed and operated Chicago Manufacturing Institute:

1. Advisory Board

Develop a 25-person Advisory Board for the metalworking component of the Chicago Manufacturing Institute. This Advisory Board is to consist of representatives of metalworking firms with a global economic orientation that are located in the Chicago metropolitan area.

Step 1: Prepare task listing, person-hour requirements for completion of standards and curriculum work of the Advisory Board.

Step 2: Prepare and mail an announcement, invitation, and qualifications reply form to all metalworking firms in various SIC codes in the Chicago metropolitan area. This mailing shall be made to chief executive officers, manufacturing operations managers, human resource managers, division managers, and chief engineers of each of these firms.

Step 3: Determine which firms qualify to participate in the metalworking component of the Chicago Manufacturing Institute by assessing their qualifications as provided on qualifications reply form accompanying first mailing.

Step 4: Visit qualified and almost-qualified firms to identify the representative of the firm in the Chicago Manufacturing Institute. Discuss the work load associated with their participation, secure agreements for both participation and part-time internship of students in those firms.

Step 5: Prepare assignments dealing with standards and curriculum for participant members of Advisory Board.

Time to Complete — Approximately 400 hours

2. Standards

Establish standards for successful completion of the high school and the community college components of the program.

Step 1: Secure published standards relevant to metalworking from available sources.

Step 2: Hold first meeting of Advisory Board; develop committees and distribute standards work assignments and schedule for completion.

Step 3: Hold first meeting of Advisory Board Standards Committee; report on progress in completion of standards work assignments and collect work assignments.

Step 4: Hold second meeting of Advisory Board Standards Committe; report on draft standards document. Finalize document.

Step 5: Hold meeting of full Advisory Board; review, modify, approve standards document.

Time to Complete — Approximately 150 hours

3. Curriculum

Establish the learning objectives for both the high school and the college components of the program.

Step 1: Secure published curricula relevant to metalworking from all available sources.

Step 2: Hold first meeting of Advisory Board Curriculum Committee; develop necessary subcommittees and distribute curriculum work assignments and schedule for completion.

Step 3: Hold meetings of Curriculum Committee subgroups; report on progress in completion of curriculum work assignments and collect work assignments.

Step 4: Hold meetings of Curriculum Committee to finalize learning objectives for high school and community college components;

Step 5: Present final draft curriculum for review to Advisory Board; secure review, modification and finalize curriculum learning objectives.

Time to Complete — Approximately 200 hours

Costs: Approximately 769 hours of work @ $26.00/hr = $20,000 plus expenses.

APPENDIX I

BOARD OF TRUSTEES COMMUNITY COLLEGE DISTRICT NO. 508
COUNTY OF COOK AND STATE OF ILLINOIS

MANUFACTURING TECHNICAL PREPARATION
CONSULTANT SERVICES
CITY COLLEGES OF CHICAGO

TO THE BOARD OF TRUSTEES:

THE CHANCELLOR

REPORTS that the City Colleges of Chicago's Productive Chicago has been awarded a planning grant to develop a Manufacturing Technology Preparation articulation program with the Chicago Board of Education.

REPORTS that the Chicago Commons Association will provide Technical assistance and resources to the City Colleges of Chicago necessary for project development.

THE CHANCELLOR

RECOMMENDS that the City Colleges of Chicago authorize the issuance of a purchase order for $20,000 from the Manufacturing Technology Preparation grant fund to the Chicago Commons Association for services to be provided to the City Colleges of Chicago during the period of December 6, 1990 to June 30, 1991.

FINANCIAL Charge to:

Prepared by:

Josué González
Vice Chancellor

Approved:

Laurence B. Stanton
Vice Chancellor

Robert C. Rogers
Executive Vice Chancellor

Respectfully submitted,

Nelvia M. Brady
Chancellor

December 6, 1990

NAME IN RED BRACKET

CITY COLLEGES OF CHICAGO

Central Administration — Purchasing Office

226 WEST JACKSON BOULEVARD PHONE: (312) 855-3080
CHICAGO, ILLINOIS 60606-6998

PURCHASE ORDER
No. 15 8906
THIS NUMBER MUST APPEAR ON ALL INVOICES, DELIVERY RECEIPTS, PACKAGING AND CORRESPONDENCE.

VENDOR NUMBER: 0000

TO:
CHICAGO COMMONS ASSOCIATION
4100 NORTH BELMONT AVENUE
CHICAGO IL 60641

DEPARTMENT OR OFFICE MAKING THIS REQUEST FOR PURCHASE
PRODUCTIVE CHICAGO

FOR SERVICE OR DELIVERY TO (RECORD FULL NAME, ADDRESS & ROOM NO.)
PRODUCTIVE CHICAGO
226 WEST JACKSON BLVD
CHICAGO IL 60606

DATE OF ORDER	DELIVERY REQUIRED BY	TERMS: F.O.B.

QUANTITY ORDERED	UNIT	DESCRIPTION OF ARTICLES OR SERVICE	DATE RECEIVED	QUANTITY RECEIVED	UNIT PRICE	AMOUNT
		CONSULTANT SERVICES FOR MANUFACTURING TECHNOLOGY PREPARATION PROGRAM. DECEMBER 6, 1990 - JUNE 30, 1991 Develop a 25-person Advisory Board for the metalworking component of the Chicago Manufacturing Institute. To consist of representatives of metalworking firms with global economic orientation thatare located in the Chicago metropolitan area. Establish standards for successful completion of the high school and community college components of the program. Establish the learning objectives for both the high school and the college components of the program SEE ATTACHMENT BOARD REPORT # 15408 DATE Dec. 6, 1990		768 HRS	$26/HR	$20,000

NO PARTIAL SHIPMENTS UNLESS PREVIOUSLY APPROVED.
CITY COLLEGES OF CHICAGO IS A PUBLIC INSTITUTION AND IS NOT SUBJECT TO SALES TAX

ACCT. LINE	ACCOUNT NUMBER					COST CODE				AMOUNT
	FUND	COLL	UNIT	OBJECT	FUNCT	PCS	CIPS	COLL	UNIT	
1.	5	15	158	50	41	12	000000	15	158	$20,000
2.										
3.										
4.										
5.										
									TOTAL →	$20,000

CENTRAL OFFICE CODING APPROVAL DATE

COLLEGE APPROVALS

CENTRAL OFFICE APPROVAL
TO VENDOR: YOU ARE HEREBY AUTHORIZED TO PROVIDE THE ABOVE GOODS OR SERVICES

ADDRESS ALL COMMUNICATIONS CONCERNING THIS ORDER TO THE COLLEGE INITIATING THE ORDER.

IN ORDER TO SPEED PAYMENT OUR PURCHASE ORDER NUMBER MUST APPEAR ON YOUR INVOICE.

THIS ORDER IS SUBJECT TO CONDITIONS LISTED ON REVERSE SIDE.

141

COLLEGE FISCAL OFFICER

DIRECTOR OF PURCHASING

PRESIDENT

VICE CHANCELLOR